RAILROAD GAZETTE

FRIDAY, SEPTEMBER 25.

Train Accidents in August.

The following accidents are included in our record for the month of August:

COLLISIONS.

REAR.

4th, a. m., freight on Cairo, Vincennes & Chicago broke in two near Westville, Ill., and rear section ran into forward one, wrecking 2 cars and killing 2 trainmen.

4th, p. m., passenger train on Old Colony ran over a misplaced switch into a freight on a siding in Taunton, Mass. The engine was damaged; 2 freight cars upset. A man standing by the track was badly injured and 3 passengers slightly hurt.

6th, a. m., passenger on Boston & Albany ran over a misplaced switch and into a construction train standing on a siding in Kittery, Me. The engine was damaged and the engineer badly hurt.

11th, very early, passenger train on East Tennessee, Virginia & Georgia ran into construction train which had been switched out at Jesup, Ga., for the night, but had been left with some cars projecting on the main track. Several cars were wrecked and 2 trainmen sleeping in the caboose were badly hurt.

11th, a. m., freight on Richmond & Danville ran into preceding freight which had stopped at Easley, S. C., wrecking caboose and 3 cars.

12th, very early, freight on Norfolk & Western ran into preceding freight at Burkeville, Va., wrecking 2 cars and injuring conductor.

14th, a. m., second section of circus train on Central Iowa ran into the first section near Eddyville, Ia., wrecking several cars and injuring 8 employés of the circus seriously and 35 slightly.

14th, a. m., passenger train on Union Pacific ran into rear of freight at Gilmore, Neb. The locomotive was damaged and engineer slightly hurt.

14th, noon, freight on Baltimore & Ohio ran into preceding freight at Cook's Mill, Md., wrecking 10 cars and killing a tramp who was stealing a ride.

14th, night, freight on Louisville & Nashville ran into preceding freight near Buckners, Ky., damaging engine and several cars.

17th, a. m., passenger train on Cumberland & Pennsylvania ran into rear of special passenger train at Cumberland Narrows, Md., damaging 1 car and injuring 5 passengers slightly.

17th, a.m., freight on New York & New England ran into switching freight in South Boston, Mass., damaging several cars and upsetting the switch engine across the track.

20th, night, freight on New York, Pennsylvania & Ohio broke in two near Shenango, Pa., and rear section ran into forward one, wrecking 12 cars, killing 1 brakeman and injuring 2 others.

21st, a.m., milk train on New York, Lake Erie & Western ran into freight car which had been left upon the main track at Pine Bush, N. Y. The car and locomotive were damaged.

24th, night, freight on Indianapolis Belt road broke in two in Indianapolis, Ind., and rear section ran into forward one, wrecking several cars and injuring a brakeman.

24th, night, freight on Chesapeake & Ohio ran over misplaced switch in Newport News, Va., and into another freight standing on a siding, wrecking both engines, killing 3 trainmen and injuring 5 others.

24th, night, freight on New York, Susquehanna & Western ran into preceding freight near Marion Junction, N. J., damaging several cars.

25th, p. m., passenger train on Philadelphia & Reading ran into freight which had stopped in Norristown, Pa., damaging engine and several cars. Two passengers were slightly hurt.

25th, night, rear section of special passenger train on Chicago, Burlington & Quincy ran into first section at Corning, Ia., wrecking several cars and injuring 8 passengers, who were militiamen on their way to the state encampment.

27th, night, car broken loose from switching freight on Pittsburgh, Fort Wayne & Chicago in Allegheny, Pa., ran into rear of passenger train, doing some damage.

29th, a. m., freight on New York, Lake Erie & Western broke in two near Middletown, N. Y., and rear section ran into forward one, wrecking 2 cars.

31st, a. m., freight on Lehigh Valley road ran into preceding freight in Waverly, N. Y., doing some damage.

31st, night, freight on Oregon Pacific ran into rear of passenger train at Corvallis, Ore., wrecking a car, killing 1 passenger and injuring 5 others.

BUTTING.

6th, a. m., butting collision on Texas & Pacific near Sparta, Tex., between passenger and freight train, wrecked both engines and 3 cars.

12th, a. m., butting collision between freight and construction train on Canadian Pacific, near Streetsville, Ont., wrecked both engines, killing 1 trainman and injuring 2 others.

12th, night, butting collision between freight and wild engine on Baltimore & Ohio near Lexington, O., damaged both engines and several cars and injured 2 trainmen.

13th, a. m., butting collision between construction trains on St. Louis, Hannibal & Keokuk damaged both engines and injured a fireman fatally.

14th, p. m., butting collision between freights on Denver & Rio Grande near Royal Gorge, Col., wrecked both engines and several cars and injured an engineer seriously.

18th, night, freight car on Pennsylvania Railroad was started in some unknown way from a siding in Pittsburgh, Pa., and ran out upon the main track and down a heavy grade, into a freight which was coming up the track. The car was wrecked and the locomotive damaged.

21st, p. m., butting collision between freights on Boston, Hoosac Tunnel & Western, wrecked both engines and 10 cars. It is said that one train did not obey orders as to meeting the other.

22d, night, butting collision between freights on Indianapolis, Decatur & Springfield near Raccoon, Ind., damaged both engines and several cars.

23d, a. m., butting collision between passenger and freight train on Pittsburgh, Fort Wayne & Chicago near Lucas, O., wrecked both engines and several cars and killed a brakeman.

27th, p. m., butting collision between passenger train and shifting freight engine on Philadelphia & Reading near Pottsville, Pa., damaged both engines and 6 cars and injured 10 passengers slightly.

28th, p. m., butting collision between passenger trains on Boston & Maine in Dover, N. H., damaged both engines and 2 cars and injured a passenger.

CROSSING.

13th, very early, Texas & St. Louis freight ran into Texas & Pacific freight at crossing in Texarkana, Tex., wrecking a locomotive and 2 cars and killing engineer.

18th, night, passenger on Baltimore & Ohio ran into Wabash, St. Louis & Pacific freight at crossing in Walkerton, Ind., wrecking several cars.

29th, very early, Alabama Great Southern freight ran into Louisville & Nashville freight at the crossing in Birmingham, Ala., damaging several cars.

29th, noon, freight on Central of New Jersey ran into Delaware, Lackawanna & Western freight at the crossing at Hopatcong Junction, N. J., damaging a car.

DERAILMENTS.

BROKEN RAIL.

3d, very early, passenger train on Milwaukee, Lake Shore & Western was derailed in Taylor, Wis., by a broken rail.

BROKEN SWITCH-ROD.

2d, p. m., freight on Illinois Central was derailed in Cairo, Ill., by broken switch-rod, and engine and 3 cars upset down a bank. The engineer was killed.

BROKEN BRIDGE.

9th, a. m., passenger on Cincinnati & Eastern broke through a trestle bridge at Nine-Mile Creek, O., and the entire train, consisting of a locomotive, 2 coal cars and a passenger car, went down and was wrecked. Three passengers were killed, 2 trainmen and 7 passengers badly hurt.

24th, a. m., freight on Rock Island & Mercer County broke through a bridge near Milan, Ill., and 10 cars went down into the creek and were wrecked, killing a brakeman.

26th, a. m., passenger on Georgia Pacific broke through a trestle bridge at Muscatine, Ala., and the engine and 1 car went down; killing 2 trainmen, and injuring 2 trainmen and a passenger.

27th, a. m., passenger train on Natchez, Jackson & Columbus broke through a bridge at Big Bayou Pierre, Miss., and engine, baggage car and 1 passenger car went down and were wrecked. Three trainmen were killed; 6 trainmen and 3 passengers injured.

SPREADING OF RAILS.

12th, a. m., engine and 6 cars of freight on Texas & Pacific were derailed near Big Sandy, Tex., by spreading of the rails.

14th, p. m., freight on Texas & Pacific was derailed in Fort Worth, Tex., by spreading of the rails.

BROKEN WHEEL.

21st, p. m., engine of freight on Bell's Gap road was derailed near Collier's, Pa., by the breaking of a truck-wheel. The engineer and fireman were slightly hurt.

BROKEN AXLE.

6th, a. m., locomotive of freight on Albany & Susquehanna was derailed at Cooperstown Junction, N. Y., by the breaking of the main driving axle. The engine upset into the ditch.

11th, a. m., 8 cars of freight on New York, Lake Erie & Western were derailed near Allegheny, N. Y., by broken axle.

12th, a. m., 16 cars of freight on Illinois Central were derailed near Anna, Ill., by a broken axle.

14th, p. m., freight on New York Central & Hudson River was derailed near Charlotte, N. Y., by breaking of an axle under the tender.

20th, a. m., as pay-train on Kansas City, St. Joseph & Council Bluffs was near Council Bluffs, Ia., an axle broke under the tender, derailing it.

21st, p. m., freight on Cleveland & Pittsburgh was derailed in Cleveland, O., by a broken axle. A car loaded with oil in barrels caught fire and 25 cars were destroyed, the track for some distance being completely destroyed also. Two tramps stealing rides were killed.

BROKEN BRAKE-BEAM.

22d, night, 6 cars of freight on New York, Lake Erie & Western were derailed near Binghamton, N. Y., by a broken brake-beam dropping on the track.

ACCIDENTAL OBSTRUCTION.

12th, very early, freight on Indianapolis Belt road was derailed in Indianapolis, Ind., at a point where trackmen had dumped a lot of ballast and neglected to put out a signal. The engine upset and the engineer was scalded.

22d, night, freight on Chesapeake, Ohio & Southwestern ran into a tree blown down across the track at Pleasure Ridge Park, Ky., and the engine and 7 cars were derailed and piled up in a bad wreck, killing 3 trainmen and injuring 2 others.

CATTLE.

6th, early, freight on Texas & Pacific ran over a steer near Gladewater, Tex., derailing 6 cars.

8th, noon, freight on New York, Lake Erie & Western ran over some cows near Almond, N. Y., and 6 cars were derailed.

18th, a. m., passenger train on Long Island road ran over a cow near Blissville, N. Y., and locomotive was derailed.

21st, a.m., freight on Northern Pacific ran over some cattle near Harriston, Wash. Ter., derailing engine and 4 cars and injuring the engineer.

27th, night, passenger train on Wabash, St. Louis & Pacific ran over a cow near Hannibal, Mo., derailing engine and 2 cars.

28th, very early, passenger train on Texas & St. Louis ran over a cow near McGregor, Tex., and the whole train was thrown from the track, injuring the conductor and 6 passengers.

WASH-OUTS AND LAND-SLIDES.

2d, p. m., engine of freight on Bradford, Eldred & Cuba was derailed in Petrolia, Pa., by a land-slide.

13th, a. m., freight on Chicago, Burlington & Quincy ran into a wash-out near French Colony, Ia., and locomotive and 13 cars were wrecked.

21st, night, freight on Central Pacific ran into a wash-out near Lucin, Utah, wrecking 2 locomotives and 13 cars and injuring the engineer.

24th, early, freight on Lake Shore & Michigan Southern ran into a wash-out near Kalamazoo, Mich., and the engine and 5 cars were piled up in a bad wreck.

25th, very early, freight on Jeffersonville, Madison & Indianapolis ran into a wash-out near Chestnut Ridge, Ind., and engine and 3 cars were wrecked.

29th, night, passenger on Albany & Susquehanna ran into a land-slide near Esperance, N. Y., and the engine was derailed and damaged.

30th, night, passenger train on New York, West Shore & Buffalo ran into a wash-out near Catskill, N. Y., and the engine and baggage car went down and were wrecked, killing the engineer.

MISPLACED SWITCH.

15th, a. m., 12 cars of freight on Lehigh Valley were derailed in Allentown, Pa., by misplaced switch.

20th, a. m., freight on New York, Lake Erie & Western was derailed in Elmira, N. Y., by a misplaced switch.

26th, p. m., engine of freight on New York, Lake Erie & Western was derailed near Binghamton, N. Y., by misplaced switch.

28th, a. m., freight on East Tennessee, Virginia & Georgia was derailed near Rome, Ga., by a misplaced switch. The engine and several cars were wrecked, killing 1 trainman and injuring 3 others.

28th, p. m., passenger train on Geneva, Ithaca & Sayre was derailed in Geneva, N. Y., by misplaced switch.

OPEN DRAW.

10th, p. m., passenger train on Grand Trunk ran through an open draw at Merritton, Ont., and both engines, baggage and express cars went into the Welland Canal. Both engines were wrecked, 2 trainmen killed and 2 others badly hurt. Proper signals were displayed at the draw, but it is said that the brakes failed to work.

MALICIOUSLY CAUSED.

1st, a. m., an engine and 3 cars of passenger train on Shell Beach road were derailed near New Orleans, La., by ties piled up on the track. The engineer and fireman were hurt.

UNEXPLAINED.

3d, a. m., freight on New York, Lake Erie & Western was derailed in Binghamton, N. Y.

5th, a. m., 4 rear cars of passenger train on Richmond & Danville were derailed near Spartanburg, S. C., and 2 of them went down a steep bank, injuring the conductor fatally and 2 trainmen and 6 passengers less severely.

13th, p. m., 13 cars of freight on Louisville, New Albany & Chicago were derailed near Crawfordsville, Ind. The engineer and fireman were hurt.

15th, p. m., freight on New York, Lake Erie & Western was derailed near Carrollton, N. Y., and 5 cars were wrecked. A tramp who was stealing a ride was hurt.

20, night, 11 cars of freight on Union Pacific were derailed near Bitter Creek, Wyo., injuring 2 trainmen and 3 tramps.

22d, a. m., 6 cars of freight on Richmond & Danville were derailed near Hillsboro, N. C.

23d, a. m., freight on Chicago & Alton was derailed near Mexico, Mo., injuring 2 trainmen slightly.

23d, night, freight on Atlantic & Pacific was derailed near Powell, Ariz., wrecking several cars. Two white trainmen and an Indian were killed.

25th, a.m., freight on Wisconsin Central was derailed near Post's, Minn., and 5 cars were wrecked.

27th, noon, 3 cars of freight on New York Central & Hudson River were derailed near Rochester, N. Y.

28th, night, freight on Louisville, New Orleans & Texas was derailed near Memphis, Tenn. The engine and 9 cars were damaged, killing 1 trackman and injuring another.

29th, a. m., car of passenger train on Indiana & Illinois Southern was derailed near Newton, Ill., and upset down a bank, injuring 1 passenger fatally and 16 others less severely.

OTHER ACCIDENTS.

BROKEN ECCENTRIC.

11th, p. m., locomotive of freight on Albany & Susquehanna broke an eccentric strap when near Cobleskill, N. Y., delaying the train an hour.

13th, a. m., locomotive of passenger on New York, Lake Erie & Western broke an eccentric near Goshen, N. Y., delaying the train some time.

BROKEN PARALLEL-ROD.

19th, a. m., locomotive of passenger on Albany & Susquehanna broke a parallel-rod when near Knowersville, N. Y. The lose end tore up one side of the cab and injured the engineer badly.

22d, evening, engine of passenger train on Philadelphia & Reading broke a parallel-rod when near Schuylkill Haven, Pa., damaging the engine badly.

SUMMARY.

This is a total of 92 accidents, in which 37 persons were killed and 172 injured; an increase, as compared with August, 1884, of 3 accidents, a decrease of 1 person killed, and an increase of 60 injured. A statement of the totals and averages will be found on another page.

The eight months of the current year to the end of August show a total of 833 accidents, 196 killed and 1,047 hurt; an average per month of 104 accidents, 25 killed and 131 injured.

The Car Coupler Trials at Buffalo.

The circulars describing the conditions under which these important trials were held were quoted at length in our last issue, but for the convenience of our readers we now subjoin a brief summary of the principal conditions prescribed.

Each kind of coupler entered for competition was to be fitted to both ends of two cars, and was to be subjected to tests both on a tangent and on a 20-degree curve. No models would be considered at all. Inventors were also requested to send in drawings and specifications of their couplers, giving detailed weight and cost of each part, and cost of applying their coupler to cars now running with ordinary draft rigging and draw-heads. The trials were conducted by the Executive Committee of the Master Car-Builders' Association, which is constituted as follows:

B. K. VERBRYCK, President M. C. B. Association, Chicago, Rock Island & Pacific.
E. B. WALL, Pittsburgh, Cincinnati & St. Louis.
JOHN W. CLOUD, Pennsylvania Railroad.
J. S. LENTZ, Lehigh Valley.
R. C. BLACKALL, Delaware & Hudson Canal Co.
F. M. WILDER, New York, Lake Erie & Western.
E. W. GRAVES, Baltimore & Ohio.
JOHN KIRBY, Lake Shore & Michigan Southern.
F. D. ADAMS, Boston & Albany.
W. McWOOD, Grand Trunk.
JOSEPH TOWNSEND, Chicago & Alton.

The members of the Committee divided their labors, Mr. Wall inspecting each coupler separately, and with the aid of his assistants, Mr. S. H. Harrington, Mechanical Engineer Pittsburgh, Cincinnati & St. Louis, and Mr. Waggoner, of the same road, ascertaining the principal dimensions of each coupler, noting the materials used in its different parts, and the leading mechanical features of its construction. These results will hereafter be tabulated, and will doubtless afford much interesting information. A somewhat similar but independent statement, giving the leading particulars of each coupler tried, is given in the annexed Table No. 1. As this

Trials of Automatic Car Couplers.

Conducted by the Executive Committee of the Master Car-Builders' Association, at the Erie Yard (Hamburg Street), Buffalo, N. Y., Sept. 15-17, 1885.

TABLE I. PARTICULARS OF COUPLERS.

NAME AND CLASSIFICATION.	MATERIAL. Draw-head.	Link.	Pin.	Dead block.	Buffer.	BRIEF DESCRIPTION.	Distance centre of draw-head from top of rail...	DISTANCE APART BODIES OF CARS. Open.	Closed.
CLASS A. LOOSE LINKS.									
Subdivision I. Pin Supporters.									
Bird				Yes	Yes	Pin supported and link kept horizontal by spring plunger	34	34	31
Brown	Cast iron	Steel roller		Yes	No	Pin supported by side-pivoted wing pushed aside by link	35-31	35	31
Curry				No	No	Pin guided by side rods	31	31	23
Fureka				Yes	Yes	Pin supported by dog	24¼	28	24
McKeen	Wrought iron			Yes	No	Pin supported by spring plunger, link guided			
Perry	Cast iron			Yes	No	Pin supported by dog, narrow opening at pin, link guided	34	26	23
Russell's Eccentric	Cast iron	Wrought	Wrought	Yes	No	Pin supported by rolling eccentric			
Smillie	Cast iron	Wrought	Wrought	Yes	No	Pin supported by spring plunger, special link attached to draw-head	32	24	22
Whitman	Cast iron			Yes	No	Special form of pin	33	47½*	45½*
Subdivision II. Catch or dog substituted for pin.									
Archer				Yes	No	Long vertical hook inside draw-head	32	27	23½
Curtis & Wood				Yes	No	Dog actuated by gravity and spring, locked by spring	35	30	24¾
Gifford					Yes	Loose link, pin can be set not to couple, but cannot be removed from draw-head	34	27½	24
Kelly	Cast iron	Wrought iron dog		No	Yes	Loose link, gravity dog	31¼	36	29
Lancaster	Cast iron	Wrought iron dog		No	Yes	Loose link, gravity dog	30	36	32
Marks				Yes	No	Long vertical hook raised by eccentric	31½	20	25
McCree	Cast iron	Wrought iron dog		Yes	No	Loose link, gravity dog	32	35	30
Payne	Cast iron	Steel dog		Yes	No	Dog when struck by link engages with link	34½	20	24¾
Union	Cast iron				No	Loose link, gravity dog	31½	31	29
United States				Yes	No	Fixed pin, with inclined dog attached, lifted when struck by loose link	32½	29	25
CLASS B. FIXED LINKS.									
Ames	Malleable	Drop-forged Siemens steel		Yes	No	Fixed link pivoted in centre, balanced, and having hook on under side	34	31	28
Stanford	Cast iron	Wrought iron dog and link		No	No	Fixed link, with dog above it.	31	40	36
CLASS C. COUPLE IN VERTICAL PLANES									
Subdivision I. Lock operated by gravity.									
Boston	Malleable	Steel knuckle		No	Yes	Knuckle locked by notch in operating lever	32½	32	28½
Dowling	Malleable iron throughout			No	Yes	Knuckle opened by spring, locked by vertical key	33½	*	*
Joo	Malleable iron throughout			No	Yes	Knuckle locked by piece swinging in vertical transverse plane	31¼	30	28
Simpson	Wrought iron throughout			Yes	No	Knuckle locked by vertical pin	33¼	55*	51*
Thurmond	Malleable iron throughout			No	Yes	Knuckle locked by piece sliding forward and downward	33	26	24
Subdivision II. Lock operated by spring.									
Hien				No	Yes	Knuckle opened by spring locked by vertical piece	34	36	34
Hills	Made either cast, wrought or malleable.					Knuckle kept in coupling position by spring, uncoupled by lever	31	30½	28
Janney					Yes	Knuckle locked by vertical pluger actuated by spring	32¼	55*	53
Muller	Wrought iron			No	No	Knuckled actuated by spring and cam	31	29½	27*
Subdivision III. Guided by "Boot," as in Miller.									
Cowell				Yes	No	Knuckle locked by gravity	31	23	20½
Hitchcock	Cast iron					Draw-head moves sideways up inclined plane to uncouple		26½	24
Titus & Bessinger						Knuckle locked on outside by radial cam falling vertically	32½	21	19
CLASS D LOOSE COUPLING BARS.									
Fitzgerald & Van Dorn				No	No	Coupling bar hook-shaped at one end, link at other, pin in centre		41	37
Le Roux & Van Aarle				No	No	Coupling bar hook shaped both ends	32	32	29
Murphy				Yes	No	Coupling bar barbed both ends			
CLASS E. HOOKS ROTATING VERTICALLY.									
Hilliard				No	Yes	Wide hooks above ordinary draw-head	32½	35¾	30
Meadows	Cast iron	Wrought iron hook		No	No	Right and left-handed hooks		29½	25
Morgan		Cast steel hook				Right and left-handed hooks	32	47½	44
UNCLASSIFIED.									
Barnes	Cast steel and wrought iron			No	No	Hooks rotating in horizontal plane beneath ordinary draw-head	32-23	31	28
Emmett	Cast iron			Yes	No	Screw clutch turning on horizontal axis			
Williams	Cast iron			No	Yes	Hook rotating in horizontal plane, engaging side of draw-head	31¾		

NOTE.—In column of distances apart of bodies of car,* denotes that cars have end platforms.

is supplemented by a perspective view of each coupler, given on the large inset in this issue, our readers have in this issue a permanent record of all the most prominent automatic car couplers in this year of grace 1885. The views of the car couplers are prepared with great care from a uniform set of photographs taken on the spot from the cars sent for trial. In order to insure uniformity of scale, each photograph was taken at a uniform distance (72 in.) from the pin or its equivalent of each coupler. All the photographs being taken at the same distance with the same camera, and with precisely similar dry plates, the scale is in all cases as nearly equal as is possible with photographs. The varied conditions of light and position under which the photographs were taken is shown by the fact that the time of exposure varied from 15 seconds to 4 minutes, but these and other difficulties were ably overcome by Mr. I. Dressel, of Buffalo, the well-known out-door photographer.

The movement of the cars was under the direction of Mr. Wilder, and the record of the actual results of the tests was kept by Messrs. Cloud and Lentz. While the other members of the Committee had less clearly defined functions, none were mere spectators of the tests, and the intelligent and appreciative interest bestowed upon the most minute details of the tests must have impressed even the most inveterate car-coupler crank with a sense of the fairness and systematic manner in which the trials were conducted. That each individual member of the Committee was thoroughly posted on the subject was no less evident, and we believe we express no more than the general sense of those present in saying that the conduct of the trials gave universal satisfaction. The only criticism was that the trials were inconclusive on two points—the ease with which one coupler would couple with other kinds of automatic couplers, and secondly, the relative safety and convenience with which they would couple with an ordinary link and pin drawbar. The first of these points was not tried at all, and the second might have received greater attention. The actual trials consumed three days, and the majority of railroad men present were necessarily absent from their regular duties for a week, and it was therefore impossible to prolong the trials. The large array of couplers presented made the trial a long one. Had the number of couplers been reduced by some preliminary test, at least a dozen might have been ruled out as possessing some grave practical defects. As it was, no less than six couplers were more or less damaged and broken either during the test or while en route for Buffalo. Others could not be uncoupled without the aid of a pinch-bar, and one became uncoupled five times in a very short distance. Had each inventor subjected his device to a private preliminary trial, much valuable time might have been saved.

The couplers were first tested on a straight and level piece of track in the Hamburg street yard of the New York, Lake Erie & Western. One of the standard class of switching engines used on that line was employed. This engine carries its own supply of fuel and water. The cylinders are 16 by 22 in., and the six drivers measure 44 in. over tires. The tractive force per lb. average pressure in cylinders is therefore 128 lbs. This is approximately equal to the tractive power of an ordinary American eight-wheel freight engine with 18 by 24 in. cylinders, and 60 in. drivers. As any car in service is liable to the shocks and blows imposed by a Consolidation engine of fully 50 per cent. greater power, it cannot be said that the cars under trial were handled with undue severity.

The following couplers which were entered for trial did not put in an appearance:

Ames Automatic.
Benedict.
Skinner.
Westbrook.

The first named is a Canadian invention, and has no connection either commercially or mechanically with the well-known Ames coupler used on the Boston & Albany, the New York Central and other lines.

The total number of couplers entered for competition was therefore 46, and the total number tried was 42.

The manner in which the various couplers stood these tests is shown under the head "On Tangent" in our Table No. 2. It will be observed that the Committee endeavored to ascertain as regards each coupler:

1. Would it couple with the standard link?
2. Would it couple with its own kind at a slow speed?
3. Would it couple with its own kind when the two cars were brought together sharply?
4. Could it be set *not* to couple when the cars were brought together sharply?

Our table supplies the answer to these questions.

Some little difference of opinion and practice appeared to exist as to what constituted a standard link. That used measured 10½ in. long and 1¾ in. wide, inside measurement, *D* shaped section, 1¼ in. iron. Several gentlemen present stated that they used links 2 in. wide inside, and considered that size to be M. C. B. standard, while Mr. Wilder stated that the standard Erie link was 11⅝ in. long and 1⅝ in. wide, inside measurement. Probably many cases of failure to couple with the standard link were caused by the fact that the dogs or pins in the coupler were calculated to take the 2 in. link, and were too wide to take the 1¾ in. link. This is, of course, a fault which can be remedied in time for the inevitable future, and let us hope, final trial which must take place next year.

A word may here be said as to the classification of the couplers. Our table follows the classification adopted by the Committee, but possibly some difference of opinion may arise as to its correctness on all points. Some may consider that the Smillie should be classed with the Ames and Stanford as a "Fixed Link." In the latter the link is pivoted on a pin in the draw-bar. In the Ames the pivot is free to move in a slot in the draw-bar, but the link cannot be entirely withdrawn or detached from the draw-head. In the Smillie the link is hinged to the draw-head, and can be entirely withdrawn from the mouth of the draw-head but cannot be detached. Some may consider this constitutes a fixed link, but the Committee decided otherwise.

The Hien coupler is classed as "coupling in a vertical plane, the lock being effected by spring." A detail drawing of the coupler, however, indicates that while a spiral spring is used to throw the knuckle open, the lock is effected by a plug or key falling by its own weight.

The difficulties in classification are further increased by the frequent changes made in the construction of some couplers. The Cowell coupler, for instance, has been very recently altered in an essential point; as shown in the test, it was worked with a gravity lock instead of the spring lock formerly used. The unlocking device is also changed.

The materials used differed also in many cases in the same coupler. In the Hills coupler, for instance, one end of each car was fitted with a cast-iron draw-head, while the other ends were fitted up with an improved pattern in malleable iron. In many cases it was difficult to determine the ma-

Trials of Automatic Car Couplers.

Conducted by the Executive Committee of the Master Car-Builders' Association, at the Erie Yard (Hamburg Street), Buffalo, N. Y., Sept. 15-17, 1885.

TABLE II. RESULTS OF TESTS.

Name of Coupler.	Operates by Gravity or Spring.	Couples with old style automatically or by hand.	Trials on Tangent.				Trials on Curve.					Remarks.
			Coupl's with standard link.	Couples with its own kind when set to couple.		Set not to couple.	Uncoupl's.	Coupl's with standard link.	Couples with its own kind when set to couple.		Set not to couple.	
				Slow.	Fast.				Slow.	Fast.		
Class A. Loose Links.												
Subdivision I. Pin Supporters.												
Bird	Gravity and spring	Automatic	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Brown	Gravity	"	....	....	...	...	.. .	....	....	No	....	
Curry	"	.....	No / Yes	....	Yes	Failed	Yes	No* / Yes	Yes	Yes	Yes	* Pin fell out; slow in coupling at slow speed.
Eureka	"	Automatic	Yes	Yes	Yes	Yes	Yes	Yes	....	...	Yes	
McKeen (adopted)	Spring	Hand	No	Yes	Yes	Yes	Yes	No	Yes	....	...	
Perry (adopted)	"	"	....	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Tried on curve with link in high and in low drawhead; pin appeared to have been greased.
Russell's Eccentric	Gravity	Automatic	Yes	Yes	Yes	Yes	Yes	Yes	....	....	Yes	
Smillie	Spring	"	Yes	Yes	Yes	Yes	Yes	...	Yes	Yes	Yes	
Whitman	Gravity	"	Yes	Yes	Yes	Yes	Yes	No / Yes	....	....	....	Drawhead broken in half afterward in switching.
Subdivision II. Catches or dogs substituted for pins.												
Archer (adopted)	Spring	Automatic	Yes	Yes	Yes	Yes	No	Yes	....	....	..	
Curtis & Wood	"	"	Yes	Yes	Yes	Yes	No*	No*	....	...	....	* Possibly caused by faulty patterns; mouth of drawhead too small.
Gifford (adopted)	Gravity	"	....	Yes	Yes	Yes	Yes	Yes	....	Yes	....	
Keily	"	"	Yes	Yes	Yes	....	Yes	Yes	Yes	Yes	....	
Lancaster	"	"	Failed	Yes	Broke	Yes	...	....	....	....	....	
Marks (adopted)	Spring	"	Yes	Yes	Yes	Yes	Yes	Yes	Yes / No	Yes	.. ..	
McCree	Gravity	"	....	Yes	Yes	....	Yes	No				
Payne	"	Hand	Hand	Failed	Yes	Yes	Yes	No	....	....	....	
Union	Spring	Automatic	Yes	Yes	....	...	Yes	Yes	....	....	....	
United States	Gravity	"	...	Yes	....	....	Yes	Yes	....	....	Yes	
Class B. Fixed Links.												
Ames (adopted)	Gravity	Hand	....	Yes	Yes	Yes	No*	. ..	Yes†	Yes	Yes	* Said to be caused by wrong lever being pulled. Set not to couple by pushing links back. † Link being adjusted.
Stanford	"	"	....	Yes	Yes	Yes	Yes	....	Not	....	No	Hook must be removed not to couple. † Failed repeatedly.
Class C. Coupling on Vertical Plane.												
Subdivision I. Lock effected by gravity.												
Boston Automatic	Gravity	Hand	....	Yes	Yes	Yes	Yes	Yes	Yes	Yes	....	
Dowling (adopted)	"	"	...	Yes	Yes	Yes	....	. ..	No*	....	....	* Failed repeatedly. Coupled finally on easier portion of curve.
Joo	"	"	Yes	Yes	Yes	Yes*	Yes	....	Yes	Yes	Yes	* A failure here probably occurred through a verbal misunderstanding.
Simpson	"	"	....	Yes /	Failed / Yes	Yes	Yes	....	Yes	Yes	....	Very recently invented, and barely finished enough for trial.
Thurmond (adopted)	"	"	....	Yes	Yes	Yes	...	. .	Yes	Yes	.. .	
Subdivision II. Lock effected by spring.												
Hien (adopted)	Spring	Hand	....	Yes	Yes	Yes	Yes	....	Yes	No	Yes	Both knuckles moved to couple or uncouple.
Hills	"	"	No	Yes	Yes	Yes	...	....	....	....	....	Badly broken in tests, and afterward in switching.
Janney (adopted)	"	"	Yes	Yes	Yes	Yes	Yes	....	Yes	Yes	Yes	
Muller	"	"	....	....	....	....	Yes	....	Yes	Yes	Yes*	* Required two men to manipulate levers.
Subdivision III. Drawhead guided by boot, as in Miller.												
Cowell (adopted)	Spring	Automatic	Yes	Yes	Yes	Yes	Yes	....	Yes*	Yes	Yes†	* Tried with one and with both heads open. † Required pulling apart.
Hitchcock	Gravity	Hand	..	....	....	Failed	No	....	No	No	....	
Titus & Bossinger (ad'p'd)	Spring and gravity	"	....	Yes	Yes	Yes	...	....	....*	Yes	Yes	* Slow in coupling at slow speed.
Class D. Loose Coupling Bars.												
Fitzgerald & Van Dorn	Spring	Hand	....	Yes	Yes	Yes	Yes	...	Yes	Yes	Yes	
Le Roux & Van Aarle	Gravity	"	.. .	Yes	Yes	Failed	No	....	Yes	Yes	....	
Murphy	Spring	"	....	Yes	Yes	Yes	Yes	...	Yes	Yes	Yes	
Class E. Hooks Rotating Vertically.												
Hilliard	Gravity	Hand	....	Yes	Yes	Yes	Yes	....	Failed	Yes	Yes	
Meadows	"	"	....	Yes	Failed	Yes	...	....	...	....	....	
Morgan	"	"	....	Yes	Yes	Yes	Yes	....	Yes	Yes	Yes	
Unclassified.												
Barnes	Spring	Hand	....	Yes	Yes	Yes	....	....	Yes	Yes	...	Draft bolt broken.
Emmett	Gravity	"	. ..	...	....	No	No	....	Yes	Yes	No	Required use of pinchbar to uncouple.
Williams	Gravity and spring	Automatic	....	...	....	....	Yes	....	Yes	Failed	Failed	Uncoupled repeatedly on curve while switching.

terial of which the coupler was made, and our list is, therefore, incomplete on this point.

It need hardly be said that a coupler which failed to satisfactorily stand the tests on a tangent, is either radically wrong in principle, or is very imperfectly fitted up. These trials, therefore, could not be said to have established much as to the relative merits of well known rival couplers. The second series of trials on a 20° 20′ curve (282 ft. radius), with the centre of the draw-bar of one car 3 in. above the corresponding point in the other car was, therefore, looked forward to with a great deal of interest, as being likely to effectually test the merits of a coupler. Nor were these expectations disappointed, comparatively few couplers passing through this test in a perfectly satisfactory manner.

The piece of track at this point was well laid with steel rails in good condition, and the only point against the cars was that two joints occurred near together, close to the spot where the cars met in their attempts to couple.

A reference to our Table No. I. will show that the height of the centre of draw-bar from rail level differed considerably in different cars. These cars were all sent for trial, and were not picked up promiscuously. Most of them had probably been sent to the shops just before the trials, to have the couplers fitted on in the best and latest style, and in most cases the repair staff would take the opportunity to examine the car, and correct any grave defects. In spite of this, however, the extreme difference in level was no less than 5 in., one car being only 30 in. from rail level, while another was 35 in. A glance down the line of heights of draw-bars will show frequent instances of difference of level of 3 in. As these cars were all empty, it may be asked what the difference in level would have been were some cars empty and some loaded? It would doubtless have exceeded 3 in. in a great many cases, and therefore the test of the Committee cannot be said to have been too severe, though possibly in some cases the difference shown in our table is caused by the couplers for trial being hastily fitted upon cars, where the necessary changes in draft rigging could not be effected in time.

The trials, which commenced at 1 p. m. on Tuesday, Sept. 15, were continued on Wednesday, and were finally concluded on Thursday about 4 p. m.

The following members of the Executive Committee then met in session at the Tifft House: Messrs. B. K. Verbryck, E. B. Wall, J. W. Cloud, J. S. Lentz, R. C. Blackall, F. M. Wilder, E. W. Graves, John Kirby and F. D. Adams.

After several hours' deliberation with closed doors, the Committee announced that they had decided to recommend the following couplers for further trial in actual service:

CLASS A—LOOSE LINK.

McKeen, A1, *Pin supporters.*
Perry, " " " "
Archer, A2, } *Catch, or dog substituted for pin.*
Gifford, " }
Marks, " }

CLASS B—FIXED LINK.

Ames.

CLASS C—VERTICAL PLANE.

Dowling, C1, *Gravity lock.*
Thurmond, " " "
Hein, C2, } *Lock effected by spring.*
Janney, " }
Cowell, C3, } *Draw-bar guided by "Boot," as in Miller.*
Titus & Bossinger, " }

It will thus be seen that the Committee selected six link and six vertical plane couplers. Detailed illustrations and descriptions of these selected couplers will appear in our next issue.

The Interior Finish of Passenger Cars.

The following paper on this subject was read at the recent convention of the Master Car-Painters' Association by Mr. T. F. Page, of the Laconia Car Co.:

The subject which your committee has assigned me, asking for my practical views and experience, namely, "The inside finish of a passenger car from the foundation up," should be considered a very important one.

Porous hard woods being most in use for this purpose, the need of some substance to fill up the pores to a level with the surrounding surface is felt, and the absorptive nature of the wood demands that it be liberally treated with liquids, or glazed over with something that will prevent varnish from sinking into it, and also into the material with which the pores have been filled. After the wood has been well filled and absorption satisfied, there seems to remain no difficulty about obtaining a fine finish in any of the usual ways, with varnish, oil finish or shellac, either left with natural gloss, rubbed down to a dead lustre or polished.

The true principle of finishing wood, it has been claimed, should be to obtain a smooth and level surface with the least possible amount of varnish or other substance which would build up a thickness on it, but it may be desirable in some cases to put a thickness on where much cleaning and scrubbing is to be done. In my own experience I have given the subject considerable thought and have tried much in the way of experiment with the view of doing away with the necessity of rubbing down coats of varnish to get a level surface. There are some difficulties in the way of accomplishing this, some of which I will mention.

The pores being of various shapes and sizes will take in and retain the filling more or less according as their forms may be adapted for it; some are in the form of holes coming end to the surface, in which case they take and hold the filling very well, while others are long, trough-like and very shoal, where no amount of skill in the use of block, knife or rag can induce it to remain. In wiping off the surplus and cleaning up with a rag in the usual manner, the filling is necessarily lowered a little below the level of the wood, and while drying, the liquid portion of the filling is absorbed to a considerable extent by the wood, causing quite a shrinkage, so that by the time it is well dried, we find by a close examination that the filling up of these pores has been so far only a partial success, and the grain of the wood has been raised up in places owing to the working in of the liquids between the fibres, necessitating the use of sandpaper which will also remove more of the filling, and we have so far quite an imperfect piece of work.

The nail holes (owing to their size and form), are still ready to absorb oil from putty, causing a shrinkage very noticeable, and in following up this filling and puttying with a coat of shellac, the alcohol partly dissolves and softens the filling so much that it does not regain its former worth.

I have given several of the advertised ready-mixed and patent fillers a fair trial and have used many different substances and formulas of my own composition, and I am inclined to the opinion that a good filler should be composed of some material which is very soft and pliable, free from grit however fine, not very quick-drying, but when thoroughly dry should be *very hard*; indeed, hard enough to resist the action of a coat of alcoholic shellac, and tough enough to admit of a moderate use of fine sandpaper.

Whatever filling we use and however skilifully manipulated, there still remains one thing which is as indispensable in this branch of car-work as in any other, and that is *time*.

Our superintendents and master mechanics have generally

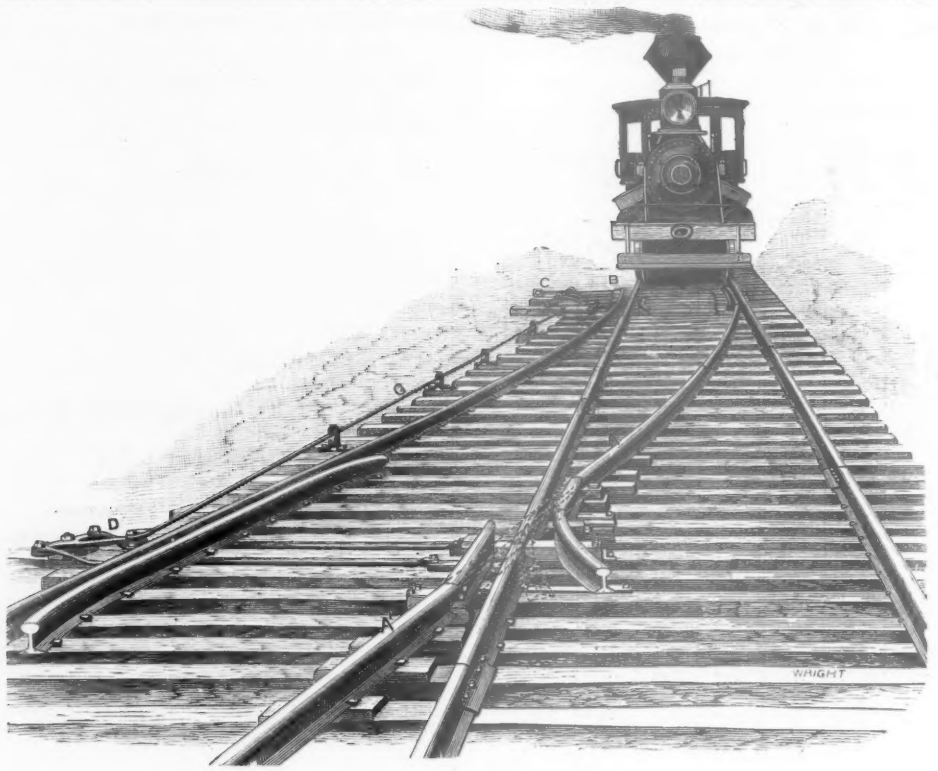


Fig. 1.—In Position for Main Track.

MANSFIELD'S FROGLESS SWITCH.

quite a correct idea of the necessity of drying the foundation coats of paint and the varnish, but who of us ever heard of one of those worthies being willing to incumber any part of the shop with a car for the reason that the filling was not yet hard enough to go ahead with the inside? A quick-drying filling containing much japan is no remedy for this, for it will not satisfy the suction of the wood. It is true that such a filling may close up and bridge over most of the pores, but anything which is put on afterward will sink into the wood and also into the dry material of which the filling may be composed.

To some extent the difficulties here mentioned can be overcome when *time and expense are allowed;* when these can be had I prefer a filling composed as here given: Equal parts best coach japan and raw oil, mixed to a thick paste with corn starch and as much litharge as can be used without discoloring the wood; thin with spirits turpentine to a working consistency, and use the same day of mixing.

After filling, comes the stopping of nail holes. Make a putty with whiting, japan, varnish and just enough oil to prevent crumbling, and color to suit the wood; leave it higher than the face of the wood, and when all is dried hard, use block and sandpaper over the whole surface, cutting down the putty at the same time. On moldings and irregular surfaces leave the putty just flush when put in.

The sandpapering done, proceed to fill all again with filling mixed the same as before. This will be partially absorbed by the wood and will build on to the filling already in the pores, and will contain enough oil to restore the color to the putty, which, after having dried, was light colored and dry in appearance; but after this second filling it cannot be seen if matched to the color of the wood.

To darken light mahogany and cherry, bichromate of potash dissolved in water is excellent, and gives it the appearance of age.

The rubbing down of varnish and the so-called hard oil finish has been done in car work considerably of late years, but does not appear to be much improvement over the same materials as the brush leaves them, certainly none in the matter of durability, and as for looks, a few months' wear reduces them to about the same general appearance.

Four or more coats of shellac rubbed down to a fine finish look very nice when just out from the shop, but soon deaden and look dull and dry and seem to fail in properly protecting the wood around the doors and windows where frost and moisture have a chance to act.

Close-grained woods such as cherry and maple, although somewhat porous, can be brought to a fine finish without any filler except to saturate the wood with a mixture of oil, japan and spirits, after which proceed in the same manner as with those woods which had their pores stuffed with filling.

Wood ceilings seem to call for about the same treatment as the sides of the car, although it may be questionable whether a varnish gloss gives the general satisfaction that a dead finish does. As for decorating the ceiling, I know of no prevailing style or tendency to change, except to use less or none at all. Many people consider it unpleasant to have the attention riveted to some example of decorative skill while traveling in a railway car, and to place that example overhead may increase those feelings to quite a degree of uneasiness. A ceiling composed of handsome grained wood with fluted moldings over the joints, and rosette corners, set off with expensive lamps and bell-cord bangers, is quite tasty of itself, certainly about as attractive as the sides of the car, where it is never thought necessary to trace any ornament in common first-class passenger cars.

I think it desirable that the subject of filling and finishing hard woods be taken up at this meeting, and if what little I have written should be taken as a commencement which will lead to a general discussion, then my object is attained.

A Frogless Main Track.

We continue herewith and complete our illustrations of the efforts now making to dispense, in part or whole, with frogs in the main track, presenting the device for this purpose designed and patented by Mr. W. W. Mansfield, Engineer of Maintenance of Way of the Chicago, St. Louis & Pittsburgh Railroad, which has been undergoing practical test for a year and a half.

It will be seen that the design of the "frog" differs markedly from the Price frogless switch, illustrated in our issue of Sept. 18; and still more markedly from the "German Frog for Factory Sidings," illustrated Sept. 11, which latter can only be regarded as a very crude device for accomplishing the same end at points where the siding is so little used that no great excellence in the turn-out track is required if the main track be not injured.

The form of frog used in Mr. Mansfield's device is shown to large scale in figs. 3 and 4 in position for taking side-track, and in fig. 1 is shown, with almost equal clearness, in position for side-track, leaving the main track clear. It consists simply of two properly shaped pieces of rail placed so as to lap over the top of the main rail, as shown in fig. 4, when thrown into position; the two pieces being moved into or out of position simultaneously by the double bell-crank lever *D*, fig. 1, operated by the rod *G* and switch-lever *C*, figs 1 and 2, in connection with the switch, which latter, as shown in the engravings, is of the ordinary Wharton type. Whether the Wharton or the ordinary split-rail points be used, however, is a matter of choice. The Wharton more fully carries out the main idea of the device, to leave the main rail absolutely unbroken and unmodified, but for exclusively trailing switches on double-track roads, the ordinary points would naturally be given the preference, especially if the turn-out was much used.

The lead rail *A A* is in the Mansfield, as in the Price switch, elevated about 2 in. above the level of the main rail this superelevation being a feature desirable in itself rather than objectionable, for reasons specified in describing the Price switch. The means for insuring safety in case the switch is accidentally left wrong for main track, however, are different. In the Price frog, it will be remembered, a cast-steel frog-bar weighing some 500 lbs. and provided with safety-wings is moved into position directly over the main rail, and in case a main line train runs against the frog it simply runs over it; with a very considerable jolt, no doubt, if running at high speed, but, it is claimed, without any real danger of derailment, even at high speeds, and at more moderate speeds with very little jolt. The frog-bar, in fact, even if left permanently wrong, is a complete, if somewhat imperfect equivalent for an ordinary frog, and is used as such for the operation of "roping," in which, the engine having passed over the switch set for main track, it is thrown over to side track, while the engine is still between the switch and frog, and the operation of roping completed by the locomotive running over the safety wings in the same way as if the frog were of ordinary type.

In the Mansfield frog the means for insuring safety are different. If the wing-rail *A* has been accidentally left wrong in the position shown by dotted lines in fig. 1, a main line train simply runs through it and pushes it out of the way; the same motion setting the switch right for main line in advance of the locomotive reaching it; although, should this operation fail to be completely effected for any reason, the same safe-guards exist at the switch itself as in any Wharton switch.

Which of these two devices for accomplishing the same end is the better, it would be profitless to attempt to determine so early in the history of both. Apparently each of them has certain decided advantages over the other, and each may under certain circumstances be reasonably preferred. As regards safety to main line trains running against a misplaced switch unknowingly, Mr. Mansfield's device would probably be regarded as on the whole the safer; for it could hardly be that a fast express train could rise and fall over a "hummock" 2 in. high in a distance of 6 or 8 ft. without a very serious if not dangerous jolt. On the other hand "roping" is impracticable with the Mansfield switch without a rope some feet longer than the lead; since it is impracticable to throw the switch while the engine is between the switch and frog. Where high passenger speeds are not usual and "roping" is, consequently, the Price would seem to be the more promising plan; while if high speeds are common and "roping" is not, the Mansfield would seem to offer the most advantages. At any rate, both seem of enough promise to merit full practical test.

The switch illustrated is from photographs of one which has been in use about a year and a half, and which, "save a little wear, is in as good condition as when first put in." It has been "run through" frequently, we are informed, to test its working, and always with success.

Fig. 4.—Section in Line A B, Fig. 3.

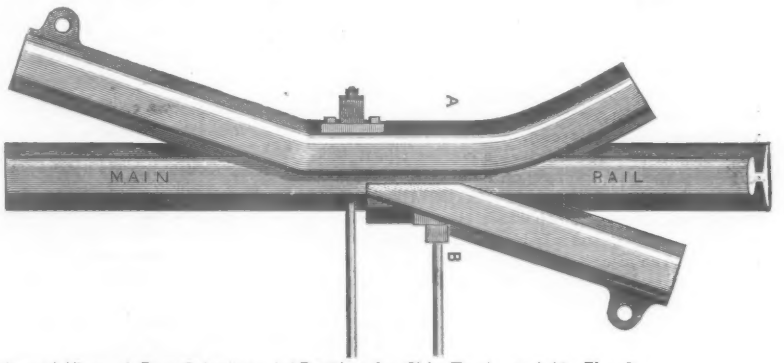


Fig. 3.—Enlarged View of Frog-Substitute in Position for Side Track, at A A¹, Fig 2.

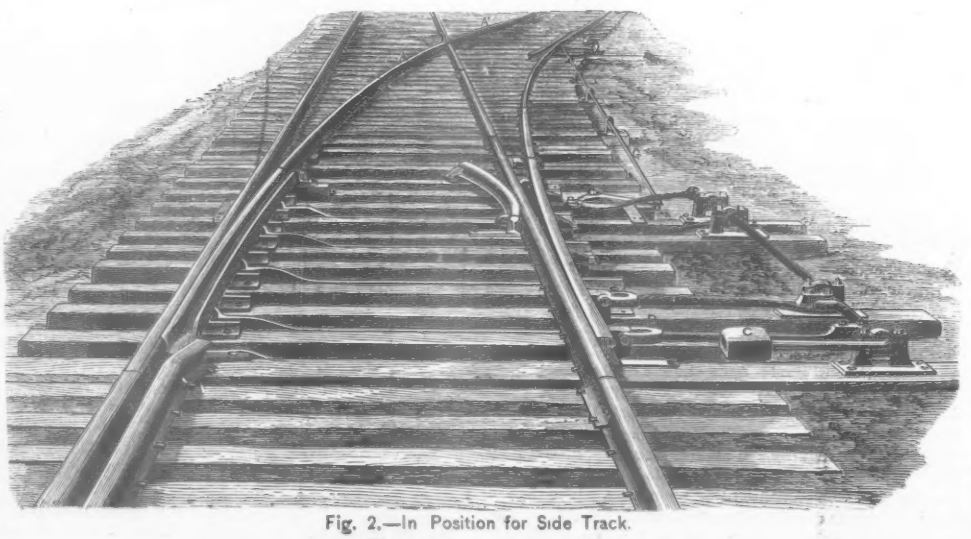


Fig. 2.—In Position for Side Track.

MANSFIELD'S FROGLESS SWITCH.

Contributions.

The McKeen Coupler—Explanatory.

TO THE EDITOR OF THE RAILROAD GAZETTE:

I ask the use of your columns to note some facts in respect to my coupler, not brought out at the trial at Buffalo (it having been shown automatically only), which justice required should be brought out.

1. It can be coupled from the lower to the higher car as well as from the higher to the lower, and could have been coupled with the Janney or Cowell, or other vertical-plane coupler, without going between the cars, by means of the link controller.

2. It can be coupled and uncoupled on a curve of 50 degrees with the greatest ease.

It has been tried at Bethlehem on a curve of 50 degrees and the worst curve on the Lehigh Valley with success.

T. L. MCKEEN.

Shop Notes in Ohio.

The Cincinnati, New Orleans & Texas Pacific Railway has now its whole engine equipment ready to change to suit the intended change of gauge. This will be rapidly accomplished when the order is given by the aid of gas-heating devices for setting the ties in. The engine trucks are arranged with bearings to suit the narrower gauge, the truck axles being also of the proper length for the latter. The truck wheels, therefore, are not at present pressed clear on to the axles, the space between the wheel hubs and boxes being occupied by a cast iron collar, while the want of finish resulting from the axle not coming clear through the wheel is remedied by a piece of wood driven in to fill out, which is a *fac simile* of an axle end with its centre and finish. To change the truck for the narrower gauge, the cast-iron collar now between the hub and box will be broken, the wooden axle end removed and the wheel pressed on flush with the axle end. Thus the only change of the truck necessary is the pressing in of the wheels.

A new engine, the "Crescent City," from Mr. Meehan's designs, has just been built. She is of the high centre of gravity type, being 9 ft. 6 in. to the top of the straight part of the boiler. She has an extra heavy foot-board, which extends well up to the fire door, to increase the weight on the drivers, which is about 65,000 lbs. Mr. Meehan has found that engines with an increased weight on the drivers over the ordinary practice are not only much easier on the track than lighter engines, but show less tire-wear, and since he has increased the driver weight, broken rails, from which this road formerly suffered, have entirely disappeared. This is accounted for by the less slipping and a more perfect balance of the reciprocating parts. The elevation of the centre of gravity of the engines of this road—which is very crooked—has resulted in many advantages. A much easier-riding engine is one result—so much so that on the trial of the first of the high engines the engineer and all who were riding on her guessed her speed from 10 to 15 miles too low, as she made 20 miles with seven cars in 19 minutes, while the highest speed guessed on this stretch of track was but 55 miles per hour. The other advantages found from this departure are much less flange wear on the engine tires, which results from the engine taking curves much easier, and in the surges and oscillations of the engine being more nearly in a line perpendicular to the top of the rail, which are therefore on the tread of the tire in place of against the flange, as on lower engines.

These engines have 18 × 24 in. cylinders, 68-in. driving-wheels, extension front, brick arch, 54-in. boiler with 236 2-in. flues.

Mr. Meehan, in his early experience as a locomotive engineer, never found, he says, an engine with sufficient boiler power for the cylinders. His aim has been to remedy this, and he has succeeded, inasmuch as these engines will blow off continually, with the fire-door partly open, when hauling a train sufficiently heavy to allow of the engine being worked full stroke and with wide-open throttle and a No. 9 injector on, wide open.

Mr. Meehan reports a large saving from the use of an electric annunciator in the tool room, a button being placed within reach of each workman in the shop, which, on being touched, exposes that number in the tool room, when a boy runs to him, takes his check and brings him what he wants—he being unable to recover his check until he has returned or accounted for the tool obtained for it from the tool room. If tools are lost or carelessly broken, the workman pays for them. Lathe or planer men, etc., are not allowed to grind any tool they use, as it has been found that more and better work is obtained by establishing gauges in the tool room, which are based on scientific principles, and to which all lathe and planer tools are ground by a grinder in the tool room. A tool-room man looks after the lathe centres, and trues them up with a special machine, thus keeping all centres of one angle.

FRANK C. SMITH.

Railroads in China.

Railway construction in China is coming before the outside world in a practical form, for discussion at all events, and perhaps for definite solution. On more than one side we hear that the Chinese Government, yielding to the exhortations of Li Hung Chang, have decided to sanction not merely the introduction of the iron horse in principle, but the actual commencement of certain lines of communication. In the prospectus of the last Chinese loan special mention is made of these undertakings, and it is no secret that several of the most important mercantile firms in China, as well as other bodies who have less acquaintance with Chinese matters, are at the present time engaged in the task of preparing plans and estimates in connection with these enterprises. This heightened interest may have no other significance than it derives from the hopes of those who see in China the one wealthy country of the world which has refused the aid of Western engineers and capitalists; but it is not of immediate importance to discuss the speculative question whether the Chinese Government are now sincere in their verbal patronage of railways, or whether these protestations are made merely to gain the approval of those who contribute to Chinese loans. A more practical and interesting subject presents itself in the consideration of the proposed railways, and of one other line which, although not proposed, seems to have recommendations in it favor.

The principal of the proposed lines are one from Tien-Tsin to Peking and another from Tien-Tsin southward through the provinces of Shan-Toong and Kiang-Soo to Chin-Kiang-Foo, or possibly Nanking, on the great river Yang-tse-Kiang. A third proposition is to connect Nanking by rail with either Hang-Chow or Shanghai, and a fourth is to carry out a similar project between Canton and Nanking, near the southern frontier. Of these proposals the first has been the most definitely described, and it may even be said the most favorably received, by the Chinese authorities themselves. This may be due to the great influence and personal ascendency of Li Hung Chang in this part of China, but there can be no doubt that if the capital sets the example in encouraging railways and in allowing them to be laid down in its immediate neighborhood, there will be an end to all opposition in the rest of the country. Now, the first two of these lines lay claim to the great recommendation in their favor that they would facilitate the dispatch of merchandise and provisions to the capital. They would simplify the feeding of the large population of the great city of Peking. In past ages, as at the present time, that operation was performed by water, originally altogether and still to some extent by the Imperial and Grand canals, but more recently by coasting vessels from the various ports to Tien-Tsin. The chief reason of the willingness shown by the Chinese to close the Tonquin question, when the fortune of war showed some signs of veering round in their favor on the Songkoi, was the threat of the French to stop the rice ships en route to Tien-Tsin. In that moment of extremity it was thought that the rice might be brought as of yore to the capital *via* the canals, but a brief examination sufficed to show that these had been so neglected that it would take large sums of money and a considerable period of time to render them navigable. The sea route being one now admittedly exposed to interruption in case of war with any naval power, the practical point to be decided is whether the canals shall be thoroughly renovated or whether a new means of communication shall be provided through the instrumentality of a railway. Arguments can be brought forward for both suggestions, but the strongest of all arguments is in favor of the latter, viz., that the foreigner will lend his money for that object, but not for repairing and cleaning out the great canals constructed by Yangti and other Emperors of the past.

We need not discuss the prospects of such lines as these in any close detail at the present moment, when no surveys have been made. Only a few general observations can be made with safety. Tien-Tsin is about 80 miles from Peking, and as both of those towns are places of great commercial activity as well as large population, there can be little or no doubt that a railway between them would prove a very remunerative undertaking so long as the Government bestowed upon it countenance and protection. The second line would also pass through well-peopled provinces and several large towns, such as Tsang, Lin-Tsing, Tsee-Nan, etc., and along a recognized trade route. It would have what may be considered the additional advantage of traversing a part of China which has not maintained its earlier high state of prosperity, and which may therefore be deemed susceptible of greater improvement than those districts which are admittedly well cultivated and the centres of a flourishing trade. On the other hand, it would be a much more serious and costly undertaking than a line from Tien-Tsin to Peking. Its mere length would not be less than 600 miles, and probably might be nearer 700 miles, and the Government might have some difficulty in securing for it the respect from the people, which is one of the first essentials if the support and sympathy of Europeans are to be enlisted in the undertaking. Moreover, this line would always have in time of peace to reckon with the active competition of the sea route.

The real stumbling-block which has to be removed before any of these designs will be realized is one of sentiment. The Chinese are loath to begin any of these railways, because they conceive that they will benefit foreigners more than themselves. What has to be done is to convince them of the contrary, and this can only be accomplished by selecting a quarter for the first railway where foreign trade is small and Chinese traffic great. As the Chinese Government intend to treat these lines as state railways, the very test undertaking to convince the Chinese of our unselfish desire for the introduction of railways into their empire would, perhaps, be the construction of a strategical line from Peking to Mookden, the capital of Manchooria. Its advantages would, no doubt, be military and political rather than commercial, but they are sufficiently obvious, and the Marquis Tseng would confer a material favor on his country if on his return to China he were to advocate such a project. It would certainly have the one great recommendation that it could not be attributed to the selfish purposes of Europeans.—*London Times.*

The Proper Basis of Settlement for the Use of Cars.

We give herewith extracts from a paper read by Mr. E. G. Squire, Car Accountant of the Chicago, Burlington & Quincy Railroad, at the annual meeting of the Car Accountants' Association, at Minneapolis, June 23 last, in which a joint mileage and per diem rate is suggested, which is substantially the system in use by the German Railroad Union for many years.

After pointing out the well-known evils connected with the present system of payment on the basis of miles run only (¾ cent per mile), and that when there is a demand for cars the mileage earned is no fair compensation for their use, and that lines in both the East and the West have hesitated to act, fearing that they would lose some fair or unfair advantage, Mr. Squire continues:

Every detention or blockade, East or West, has apparently been misunderstood, and the remedy has always been to build more cars. The result is, that each successive rush causes a blockade that is worse than its predecessor, and detention from other causes becomes greater, simply because the number of cars that could not be, or were not, previously handled promptly, has been continually multiplied without increasing any of the other already overburdened facilities. Naturally enough the result has been, both East and West, for each road to get all the cars they can, and hold them. The getting rid of them has been entirely an after consideration, and the roads getting the most cars and having the greatest holding-on facilities have thought they fared the best.

It may not be amiss to say in this connection that Chicago, one of the greatest railroad and commercial centres of the world, is fettered during any great movement of grain by its system of handling what are technically known as "transfers." Eastern cars not wanted for through loading are loaded to Chicago, locally, and reconsigned to Eastern roads with grain sold by sample. This is done regardless of the ownership of the cars; consequently each car has eight or ten chances of being reconsigned *via* the wrong route to one chance of its being routed correctly. Consequently the eight principal Eastern roads are kept busy transferring cars belonging to all the other roads. This is done at a large cost, both of money and labor, and at a great detention of equipment, and the time lost is never regained while the rush lasts. In addition, the chances for a blockade are very largely increased by such a system.

Western cars suffer proportionately, being often detained for transfer long enough to make a round trip to the seacoast and back.

There being no expense for holding a foreign car for transfer, and no mileage allowed for the switch movement, the delays go on indefinitely, for the reason that the loss is borne by their competitors or connections. This is undoubtedly also true, to a greater or less degree, with every city and transfer point in the country.

It is my opinion that the present state of affairs is wrong, and the sooner a change is made the better it will be for the railroad interests of the country. I also believe that this state of affairs is the outgrowth of carelessness in regard to the detention of cars, and that the latter had its origin in paying for the use of cars on a purely mileage basis. I am of the opinion that the true solution of this matter is not to increase the number of cars, but to increase terminal facilities, and make quick trips with a smaller number of cars. I think that the seemingly trivial matter of a per-diem charge, in addition to a mileage charge, would lead the way to bring this about more quickly than any other plan that can be devised. It seems to me that this is a practical solution of a problem that now costs, directly and indirectly, an amount compared to which actual mileage of cars is insignificant.

There will of course be isolated cases of delays under any system, but the present mileage plan is the foundation, *the underlying principle*, of these wholesale evils. The latter have grown so steadily, but so imperceptibly, that they have not been generally realized, and the trouble has been charged to other causes, while the sufferers from the delays have had no recourse—the system providing none. Consequently, these abuses will last and continue to grow as long as the conditions continue to favor them.

The remedy is plain: The settlements for all services of cars should be based on both time and mileage, the rate for which should be reasonable—equitable to the car-owner, and not oppressive to the company using the cars. I would suggest that this rate be made ½ cent per mile per car for each mile run, loaded or empty, and 25 cents per day for each and every day. This rate can of course be modified in either direction, as may seem best after giving it a practical trial.

It is my opinion that this rate is low enough, and will be high enough to interest railroad companies in the matter of detentions. I believe this plan will send foreign cars home empty that cannot be immediately loaded in the proper direction. The mileage should be no longer and no shorter under either system, and if each car was handled with reasonable promptness one charge would about equal the other, except that the plan proposed will be more equitable. This follows from the fact that the delays of a car are the same on a short as on a long haul, but the shorter hauls would earn but little mileage. A per-diem rate would equalize this, and no matter how long or how short the trip, if the car is detained, the per diem would continue to multiply, and corporations practicing economy (and the manner of holding foreign cars would seem to indicate that they all do) will start cars for home with the least delay consistent with economical handling. If, on the other hand, the car is held for *bona fide* loading, the revenue derived will amply repay the slight additional cost.

The supposed advantage gained under the present plan of holding a car indefinitely, because there is a possibility of loading it sometime, is wrong. I contend that there is no real advantage in holding a car indefinitely for a possible load that it may or may not get. The supposed advantage is a delusion, for the reason that each road in self-defense is compelled to reciprocate by doing the same thing. If such is not the case the advantage gained by one road is very slight compared to the loss and inconvenience suffered by others.

The per-diem system, if adopted, will bring about a different state of affairs in the plan of handling of cars. Railroads will be compelled to insist on prompt loading and unloading, and shippers and receivers would quickly join in the movement with enthusiasm, and would, I think, gladly keep step to the new music.

There is no reason in running trains at a high rate of speed and then allowing the cars to lie around a station after their arrival: and, under the arrangement I have proposed, no company could afford to hold cars any length of time for any purpose, or under any pretext. The now indispensable and hard-working lost-car agent will have no vocation, and tracing for cars will be a thing of the past. Each company for itself will reverse the present urgent and unrequited necessity for tracing to them—in short, I believe the proposed plan will bring about a new era. Each company will receive a fair equivalent for the use or misuse of its equipment. All roads would be more careful in ordering cars, or of being in the market for business they cannot handle, and handle promptly. Last and best, however, there will be plenty of cars to do business with at such times as, under existing circumstances, now produce a car famine.

I do not recommend any change in the settlement of line car mileage. These cars are soliciting special business, and are often held subject to the order of either shippers or line agents; but the education that the new system will produce will also be a great aid, and they would feel and realize its benefits.

The Montreal Cable Railroad.

The cable railroad or elevator by which the summit of Mt. Royal, back of Montreal, is reached, has now been in successful operation nearly a week. The railroad is 403 ft., horizontal measurement, the height 275 ft., and the length of track 510 ft. It is built in a segment of a circle with a reversed side of twelve feet, and has an incline of about 33½ degrees. The road is supported by 16 iron pillars set in stone foundations, and the balances are of wood 12 by 12 in. The gauge of the road is 5 ft., with a distance between the tracks of 4 ft. The cars are drawn to the top by means of a stationary engine of 75 horse-power at the top of the mountain. The wire ropes are three in number, two of them being 1⅛ in. diameter and the middle one 1¼ in. The two smaller ones have been tested with a strain of 35 tons and the centre or safety rope with a strain of 43 tons. The ropes pass over sheaves 6 ft. in diameter, and are wound over two drums of wood and iron 10 ft. in diameter, and are a direct pull upon the cars. The centre or safety rope runs independently of the engine, and is attached to both cars, so that, in event of the two outside ropes breaking, the centre one would hold the cars in check, beside which the large wheel of 11 ft. diameter is provided with brakes which may be applied from the platform at the top of the incline by the engineer. The fare on the incline is 5 cents up and 3 down.

RAILROAD GAZETTE

Published Every Friday.

EDITORIAL ANNOUNCEMENTS.

Passes.—*All persons connected with this paper are forbidden to ask for passes under any circumstances, and we will be thankful to have any act of the kind reported to this office.*

Contributions.—*Subscribers and others will materially assist us in making our news accurate and complete if they will send us early information of events which take place under their observation, such as changes in railroad officers, organizations and changes of companies the letting, progress and completion of contracts for new works or important improvements of old ones, experiments in the construction of roads and machinery and in their management, particulars as to the business of railroads, and suggestions as to its improvement. Discussions of subjects pertaining to* ALL DEPARTMENTS *of railroad business by men practically acquainted with them are especially desired. Officers will oblige us by forwarding early copies of notices of meetings, elections, appointments, and especially annual reports, some notice of all of which will be published.*

Advertisements.—*We wish it distinctly understood that we will entertain no proposition to publish anything in this journal for pay,* EXCEPT IN THE ADVERTISING COLUMNS. *We give in our editorial columns* OUR OWN *opinions, and those only, and in our news columns present only such matter as we consider interesting and important to our readers. Those who wish to recommend their inventions, machinery, supplies, financial schemes, etc., to our readers can do so fully in our advertising columns, but it is useless to ask us to recommend them editorially, either for money or in consideration of advertising patronage.*

THE ST. PAUL, MINNEAPOLIS & MANITOBA.

Ten years ago, what has become the St. Paul, Minneapolis & Manitoba Railway, and was then the St. Paul & Pacific, was one of the most striking of the shocking examples of bad investments in new railroads. In the year to Aug. 31, 1873, working then 318 miles of railroad, it earned $629,688 gross and $166,363 net, the latter being at the rate of $523 per mile of road. No interest was paid on any part of its $15,773,000 of debt—about $50,000 per mile. In 1874-75 the net earnings were still less. In 1876-77, when 104 miles of the St. Vincent Extension in the Red River Valley had been completed, the net earnings rose to $316,000, or $749 per mile. The bonds of the company became almost worthless, but a receiver appointed in 1873, and some auxiliary companies succeeded in completing the line to the Dominion border in 1878, in time to save the land grant. The present company was organized to buy the St. Paul & Pacific at foreclosure sale, and when it had secured it and the other roads making the line from St. Paul to St. Vincent and St. Paul to Breckenridge, 565 miles of road, it had a funded debt of only $7,266,000—less than $13,000 per mile. The swollen capital of the St. Paul & Pacific had shrunken far below the cost of the property. At the same time its land grant, largely in the Red River Valley, which had been of scarcely any help in keeping the old company alive, being then unsalable, was in demand. The country on the lines of the road filled up rapidly; the construction of the Canadian Pacific was begun in Manitoba, requiring vast quantities of material, all of which had to pass over the St. Paul & Manitoba road, as did the tide of immigration into the Canadian Northwest. Thus what the new proprietors of this railroad had got for a trifle, all at once became a very productive property. The land grant alone is likely to bring more than that part of the road cost which was constructed at the time of the organization, and the land went with the road. What from 1873 to 1877 was almost worthless, became in 1882 and 1883 one of the most productive railroad properties in the country, earning net per mile nearly $4,000, which is more than any Chicago railroad earned, except the Rock Island and the Chicago & Alton. It would hardly have been possible for the circumstances to be more favorable. In addition to the large net earnings, the land grant was yielding large amounts, with which the funded debt was reduced. In the year to June 30, 1882, a dividend of 6½ per cent. was paid on the stock; in 1883, 9½; in 1884, 8, and last year, 6½ per cent., and in addition to this the stockholders were permitted to take 50 per cent. of their holdings in the consolidated bonds of the company on paying 10 per cent. of their face, which very questionable sale was equivalent to a dividend of 45 per cent. In 1881–82 the surplus over fixed charges was enough for a dividend of 12 per cent., and in 1882–83 to one of 17½ per cent. A large amount, it is said, paid for improvements at this time was charged to expenses, and the accumulated surplus went for construction, which did not swell the capital account.

Meanwhile the company did not stand still, but its policy apparently was to put railroads so near together in the Red River Valley that there would be but a poor chance for a competitor there. Within a distance of less than 60 miles from east to west, just north of the Northern Pacific, it has no less than six lines extending northward, two of them going all the way to the Manitoba line, one about half-way, and the others 30 miles or more to the northward. It has also secured extensive terminal grounds in St. Paul and Minneapolis, built a railroad entrance there which can accommodate several roads, made a line which, in connection with part of the St. Paul & Duluth, gives it an outlet on Lake Superior, and constructed several branches besides the lines in the Red River Valley, so that the 565 miles which it owned when organized in the spring of 1879 have grown to be 1,497 miles, a large part of which is in the best wheat country this side of the Rocky Mountains.

Some of the circumstances which made this company so extraordinarily prosperous in 1883 and before were temporary, and they no longer being effective, the road has had a large decrease in earnings, so great that it is easy to suppose that it is now unprosperous, while the fact is that its profits were so enormous that a considerable shrinkage still leaves them large, being last year (to June 30 last) about 11¼ per cent. on the capital stock, not counting the income from the land grant.

In 1881–82 the Manitoba traffic, including the materials for the Canadian Pacific, yielded the railroad more than $900,000. The opening of the line of the Canadian Pacific from Winnipeg to Lake Superior in the spring of 1883 deprived this road at once of nearly all the construction traffic and much of the other traffic to Manitoba. The completion of the Canadian Pacific line north of Lake Superior through to Montreal will doubtless still further reduce it somewhat. Moreover, in every new country there is a lull after the first rush of immigration. The rush to Dakota, Northwestern Minnesota and Manitoba is over for the time, and though probably more people than ever are bringing the soil under cultivation there, there are not nearly so many people starting towns and trying to establish themselves in business, which made traffic good while it lasted. The very low price of wheat tends to prevent any considerable immigration to this country, for its chief business is wheat-growing, and wheat-growing at present prices is not profitable; but this does not prevent those who already have farms there from doing their best to get something out of them, and from bringing more and more ground under cultivation every year.

In its last fiscal year the Manitoba Railroad, therefore, suffered from the almost total withdrawal of the Canadian Pacific construction traffic, from a considerable diversion of the other Manitoba traffic, from a great decrease in the immigration to the country on its own lines and to Manitoba, and from the very low price of the great staple production on its lines. Thus there is a great change from 1882 and 1883, yet the road earned a very large surplus over its fixed charges. The latter are moderate, amounting to $1,358 per mile last year. The company has still 2,732,000 acres of its land-grant, the original amount having been 4,276,000. The sales so far have averaged considerably more than $5 per acre. It is probable that the more valuable lands have been sold, but the average price realized last year was $4.84. The expenses of the Land Department absorb a considerable part of the receipts, yet the 725,000 acres sold so far since the organization of the present company have resulted in yielding $2,944,636 towards redeeming the first-mortgage bonds. At this rate nearly $11,000,000 would be realized in course of time from the remainder of the land grant. Perhaps half that amount will be nearer the actual result.

The course of the land sales indicates very clearly that immigration and land speculation have greatly fallen off, the acres sold in successive years having been :

Year to June 30.	Acres.	Year to June 30.	Acres.
1880	268,741	1883	104,245
1881	97,863	1884	83,908
1882	203,343	1885	65,556

The question is complicated by the entries of government lands, however, which have been in land districts within the territory of this road:

	1881-82.	1882-83.	1883-84.	1884-85.
No. entries	10,987		10,771	9,964
Acres	1,705,300	1,103,434	1,691,799	1,074,849

The entries of government land, however, in a very large number of cases are not made for settlement, but for speculation, as may be judged by the fact that the entries of the first two years here given in three land districts in Northwestern Minnesota and Northeastern Dakota exceed the entire acreage now under cultivation in the territory of Dakota.

The decrease in the earnings of this railroad since 1882–83 has been only less rapid than the increase before. From 1879–80 to 1882–83, with the mileage doubled, passenger earnings increased 202 per cent., freight earnings 222 per cent. and net earnings 198 per cent. Last year, with the mileage 21 per cent. more than in 1882–83, the gross earnings were 15 per cent. less. The gross and net earnings per mile worked have been :

	Gross.	Net.		Gross.	Net.
1880	$4,471	$2,489	1883	$7,605	$3,995
1881	4,954	2,607	1884	5,992	3,282
1882	7,159	3,573	1885	5,230	3,057

The increase in gross earnings per mile was $2,651 from 1881 to 1883, and the decrease in them was $2,375 from 1873 to 1875. In net earnings per mile there was an increase of $1,388 (53 per cent.) from 1881 to 1883, and a decrease of $938 (23½ per cent.) from 1883 to 1885. The decrease has been proportionally much larger in passengers, and $674,885 (10 per cent.) in freight. Most of the decrease was from 1883 to 1882, coincident with the opening of the Canadian Pacific to Lake Superior. Of the total decrease, of $1,372,000 in gross earnings since then, only $480,700 occurred last year. No traffic statistics are reported for last year, but as the average freight rate is given, the ton mileage can be calculated, and it is found to be decidedly larger than in any previous year. From 1883 to 1884 the decrease in passenger traffic was 21½ per cent.—a very little more than the decrease in passenger earnings. It is doubtless the through travel that fell off most last year, but apparently the rates on it were about as high as on the local travel, and the decrease in passenger earnings was 16 per cent. Though there was a large falling-off (8½ per cent.) in freight earnings from 1883 to 1884, there was no decrease in freight traffic, the falling-off in the shipments of merchandise, etc., to Manitoba, which yielded profitable rates, having been made up by the increase of grain shipments, on which the rate is necessarily lower, and, in view of low prices, was reduced. The passenger and ton miles for successive years have been as follows, the passenger mileage last year being estimated on the basis that the rate was the same as the year before. The figures are for *millions* of passenger and ton miles :

	1879-80.	1881-82.	1882-83.	1883-84.	1884-85.
Pass-miles	25.4	54.4	68.1	53.5	45.0
Ton-miles	93.3	189.9	341.5	340.3	395.6

Thus the reduction in freight earnings since 1883 has been due to lower average rates, partly occasioned by a reduction in the proportion of the more profitable freight, and partly to a reduction in the rates on produce shipped over the road to the east. The actual average rates for four years have been 2.51, 1.91, 1.79 and 1.53 cents per ton per mile.

The reduction in the rates on grain was absolutely necessary. Prices are so low that there is little or no profit in wheat-growing at best, and if the country on this road is to grow, farming must be profitable in ordinary years. It is always a question with a new railroad in a new country whether it can endure the inevitable reduction of rates which follows its first settlement. The Manitoba was fortunate in having extraordinary prosperity before the decline began, but the good returns reported last year were only secured by a very large reduction in the working expenses, made in spite of an increase (since 1883) of 21 per cent. in length of road worked, and apparently with an increase in freight traffic about equivalent to the decrease in passenger traffic. We shall therefore do well to see in what department the reduction of $1,085,000 in reported working expenses since 1883 has been made.

A large part of it ($252,634) is in the expenses for "conducting transportation," which are expenses which cannot be postponed. The decrease in these is nearly 27 per cent., while the decrease in all expenses is 23½ per cent. It was probably largely due to a decrease in train mileage. This is not given for 1885, but from 1883 to 1884 there was a decrease of 24 per cent. in freight-train mileage, without any decrease in freight traffic. The reduction of grades on the main line probably had much to do with this. In "motive power" a decrease of $381,000 (25½ per cent. is reported. This includes the cost of maintenance of locomotives. Per train mile the expense under this head was 42 cents in 1883 and 41 cents in 1884—not a

notable difference. There were more locomotives (201, against 177) in 1884 to make the smaller train mileage, and a reduction in expenditures for repairs is natural under those circumstances. In cost of maintenance of road and structures there has been a reduction of $333,000 since 1883—26 per cent. Here reductions in expenditures are common when earnings fall off, and here they may fluctuate greatly, falling off largely when rails, ties and structures have recently had extensive renewals. The expenditures under this head were $1,239 in 1883, $834 in 1884, and $656 last year. This is a very great reduction, which must largely have been due to a reduction in the amount of work done. And that the renewals were much less than the average requirements is further shown by the statement in the report that only 11 miles of track were relaid with steel during the year, and only 156,697 new ties put into the track. At this rate the rails would be renewed in 154 years and the ties in 28 years. As the road is mostly new, doubtless much less than the average renewals are needed now; but it should be remembered in estimating future expenses.

The other head given is maintenance of cars, the decrease in which since 1883 has been $76,737, or 18 per cent. The number of cars has increased from 4,606 to 5,072, and the cost of maintenance per car has decreased from $90.50 to $67.50, or 25 per cent. The latter figure is not smaller than on some other railroads, and in view of the large decrease in passenger traffic, a large decrease in the cost of maintaining this costly part of the car equipment was to be expected. By far the larger part of the decrease was from 1883 to 1884. It may be noted also that in 1882 the cost per car was $73, and in 1881 $85, the cost in 1883 having been unusually large.

Thus, so far as the details of working expenses and traffic are published, we find only in maintenance of road and structures a saving which will have to be made good in future years, and this one which may very well have been entirely proper at this time, when most of the rails and ties are new.

That there will be hereafter a great growth of traffic on this railroad seems inevitable. Probably no railroad has been built since the Burlington & Missouri River Railroad in Nebraska was opened that has so large a proportion of fertile land on its lines, and very few new roads are so little likely to have their territory invaded by competing lines. It has also, like other railroads on the border, an opportunity to make profitable extensions in the future, the country north and west of Devil's Lake being fertile for a further distance west, it is said, than anywhere else in the United States. In this territory, however, the Manitoba may very likely meet with competition, though the probabilities are that it will some time have a line north of the Northern Pacific as far west as the Rocky Mountains. That there will be a great growth in traffic very soon, however, does not seem probable. Nothing but high prices for wheat is likely to cause a rush of settlers to Dakota next spring, and of this there is as yet no sign. But as soon as wheat-growing becomes remunerative, as it will be some day, and very likely within a year, this country is sure to grow rapidly, the more so because here, and elsewhere on the lines of the Northern Pacific and the Oregon Railway & Navigation Co., are the only large bodies of very cheap fertile lands left in the United States. The development of lake traffic on Lake Superior is very greatly to their advantage. Devil's Lake and Pembina are not so far from Duluth as Kansas City and Omaha are from Chicago, and to-day wheat is carried from Duluth to Buffalo for 2¾ cents a bushel.

THE CAR COUPLER HOLOCAUST.

II.

The records of the Baltimore & Ohio Employés' Relief Association extend now over a period of nearly four years, and cover nearly all accidents of every kind happening to nearly all the staff of that road; the membership having begun with nothing in May, 1880, and increased very rapidly so as to average about 16,000 members for the three years 1882–4. According to the rules of that Association every member either sick or injured draws a certain benefit. The record of the nature of the injuries or sickness on which such benefit is claimed is very elaborately and minutely kept, and was printed in full, from May, 1880, to October, 1883, in the annual report for 1883, although in the last report this record is not continued. Including that for the single month of August, 1885, which we deduce from another source, this record is, in the aggregate, as follows. Although we cannot give the exact average membership for each period, by comparing the ratio of accidents to diseases and otherwise, it will be seen that there is no indication that the proportion of the total number of employés injured or suffering from disease has greatly varied from the formation of the organization:

TABLE I.

[*Record of Employés Killed and Injured by Accident and Suffering from Natural Disease in the Baltimore & Ohio Railroad Employés' Benefit Association.*]

	Kil'd.	Injured.	Total casualties.	Diseases.	Grand total.
Total					
1 mo. (August, 1885)	4	206	210	364	574
12 mos. (Sept. 30, 1882-83).	57	2,378	2,435	6,389	8,824
21 mos. (Jan., 1881-Sept. 30, 1882)	75	3,334	3,409	9,566	12,975
8 mos. (May, 1880-Dec. 31, 1880)	16	627	643	2,234	2,977
41 mos. total	148	6,339	6,587	18,189	24,776

						Per cent. of total claims from disease.
Per month.						
August, 1885	4.00	206	210	364	574	63.3
12 months 1882-3	4.76	198	203	532	736	72.5
21 " 1881-2	3.57	158	162	456	610	74 9
8 " 1880	2.00	78	81	279	371	75.2

This Association includes in its ranks something over $\frac{1}{37}$ part of the total of railroad employés in the United States in 1885, and about $\frac{1}{26}$ part of those in 1880. It is, therefore, so far as numbers go, a pretty fair basis from which to draw conclusions as to certain facts at least pertaining to the whole body.

Table II. below shows the record of accidents to this body of men, of various kinds and degrees of severity, for the year ending Sept. 30, 1883:

TABLE II.

[*Record of the Nature of the Injuries to Employés in the year ended Sept. 30, 1883, and for the 29 months preceding (May, 1880–Sept., 1882). Average membership in 1882-3, about 16,081; for 29 months, unknown.*]

	12 months.—Sept., 1882-3. No.	Ratio.	29 months.—May, 80–Sept. 82. No.	Ratio.
Accidental deaths	57	1 to	75	1 to
Lost arms and legs	73	1.28	120	1.60
Broken or dislocated bones	171	3.00	273	3.65
Total serious casualties	244	1 to 4.28	393	1 to 5.25
Crushed limbs	591	10.36	745	9.93
Injuries to body	112	1.96	180	2.40
Injuries to eye	120	2.10	111	1.48
Total less serious casualties	823	1 to 14.42	1,036	1 to 13.81
Misc. lacerations, contusions and sprains	1,101	19.30	1,657	22.10
Scalds and burns	102	1.79	118	1.67
Injuries (not deaths) off duty	108	1.89	130	1.73
Total minor casualties	1,311	1 to 22.98	1,905	1 to 25.50
Total all casualties except death	2,378	1 to 41.68	3,334	1 to 44 56

Most of the heads of this table include several subheads. Thus, "injuries to body" includes injuries to head and face, back and spine, testicles, rupture, abscess from accident and internal injuries. We have in it a tolerably clear indication of how it happens that the ratio of injuries to deaths is so much lower in some state and other official reports than it is in others. It is simply a question of what is and what is not an injury worth reporting, and thus we found in our last article that the reported accidents in the state reports vary from 1 killed to 2.34 injured to 1 killed to 4.79 injured, averaging 1 to 3.73. We have in the table giving Baltimore & Ohio experience all but absolute proof that none of the state commissioners are hearing of enough cases of injury to cover those which are less serious than (1) loss of an arm or leg or (2) a broken or dislocated bone; for these two classes of injuries alone amount in Table II. above to from 4.28 to 5.25 injuries to one death, which is as large a ratio as any state reports show; while nevertheless there were on the same road in the same time from *seven to ten times as many* of such minor injuries as lacerated wounds, crushed limbs, rupture, injuries to leg, arm, back, spine, eye, internal injuries, etc., etc., which must be regarded by employés as sufficiently unpleasant. In other words, we may say the law to be, that for every death (and deaths are of course for the most part reported much more faithfully than any class of accident) there are:

Of severe injuries, lost limbs or broken or dislocated bones (reported to state commissioners or census)	3 to 5 injuries.
Of less serious injuries, lacerations, contusions, etc., etc. (not reported)	35 to 40 "
Total, for each employé killed	38 to 45 injuries.

These precise figures can only be regarded as a very rough approximation, and it is to be remembered that there is a natural tendency in a beneficiary organization to exaggerate everything into an injury which can possibly come under that head; but this is a far more serious danger with diseases than with accidents, which latter can hardly be fraudulently claimed; and although there are no other available statistics entitled to anything like the weight of the Baltimore & Ohio record, on account of the large numbers in the latter, yet that there is no very radical error or peculiarity in the record is indicated by many minor evidences; such, for instance, as the statistics of car-coupling accidents which Mr. Charles Paine caused to be kept on the Lake Shore & Michigan Southern Railway for the year before and after the use of coupling sticks was made compulsory. This record showed:

	Accidents in coupling cars.—Killed.	Severe injuries.	Slight injuries.
1878	2	23	75
1879	2	13	47
Total	4	36	122
or	1 to	9 +	30½ = 39½

Yet the Lake Shore, in the following year, 1880, only reported to the Census 30 killed and 75 injured, of all classes, or 1 to 2½; and similarly the Baltimore & Ohio, which in 1880–83 had in its Employés' Association from 22 to 45 cases of accidental injury to one death, only reports to the Census 31 killed and 133 injured in 1880, or 1 killed to 4.3 injured, against 57 deaths and 2,330 injuries in 1883, when the number of locomotives was only three greater and the traffic not greatly changed. It is true that (in addition to the fact noted, that the statistics of a benevolent association are to be regarded with some suspicion), there is a possibility that some 4 per cent. of the deaths are received "off duty" (as the table shows that some 4 per cent. of the injuries were received), and hence a part of them originated, no doubt, from causes disconnected with their employment, but the increase in number of deaths is in itself notable, and the difference in number of injuries astounding.

There is, in view of these facts, little use in splitting hairs over what is the real number of injuries, for according to the severity of what is called an injury it may be anything from 3 to 50 times the number of those killed. All that concerns us is to remember that there are many times more *real* cases of bodily danger and harm than find their way into reports; but assuming the number of locomotives to each employé killed to be the same in 1884 as in 1880 (the number having increased in that period from 17,413 to 24,587), we have:

Employés killed in U. S., 1884 (against 1, 745 in 1880.)	1,755
" severely injured, 1884 (1 to 4)	7,020
" less severely injured, 1884 (1 to 16)	28,080
" slightly injured, 1884 (1 to 20)	35,100
	70,200

As respects the proportion of the total casualties to employés arising from coupling cars, much discrepancy is to be expected in comparisons of state returns since it is a matter of common knowledge, which appears in many ways in the statistics, that the *proportion* of those killed to those merely crippled or maimed is much smaller with coupling accidents than with most others. Thus, in New York State, in 1884, only 11¼ per cent. of those *killed* but 48¼ per cent. of those *injured* are charged to coupling cars; in Michigan, 22½ and 63 per cent. respectively, and in Ohio, in 1880, the difference is as striking as between 7 per cent. of those killed and 40 per cent. of those injured.

Hence the more faithfully injuries are reported, or rather, the further down in the list of injuries the line is drawn which divides those reported from those not reported, the greater will be the *proportionate* number of coupling accidents. This appears strikingly in the following Table III., compiled from the state reports, which illustrates about the extremes in each direction of a large body of similar statistics which might be presented; in all of which the apparently varying importance of coupling accidents is (for the most part) only apparent. Thus, in Table III., the proportion of coupling accidents in Massachusetts and Iowa is noticeably less than in New York and Michigan; but then the proportion of injuries reported is also lower, as shown by the last line but one of the table. Similarly, in the earlier years of Massachusetts and New York, the proportion of coupling accidents is less than in the later years; but then the same reason why this should be so can be at once detected. A difference in operating conditions may explain a part of the discrepancy between Massachusetts and New York, for example, but the table affords strong presumptive evidence that when the ratio of injured to killed is as great in Massachusetts as in New York, the proportion of coupling accidents also will be about as great.

That a very large part of the slighter accidents are caused by coupling cars is indicated in a curious way in the schedule of established surgical fees in the Baltimore & Ohio Employés' Relief Association. After opening the list with "Office consultation (ordinary), $0.50," it proceeds with this meaning expression:

Dressing hand or foot (first time) *in ordinary coupling accidents* (italics ours)	day,	$2.00
	night,	3.00
Subsequent dressings at office, when absolutely necessary.		1.00

The schedule then proceeds with "Amputation at the hip joint, $75," and so on through a long list; but in no other case is a *cause* for the operation assumed, as if it were a matter of course. The implication that of the slighter accidents most (or at least a very much larger proportion of them than of the more serious accidents) occur in coupling cars is a plain one. Unfortunately, the Baltimore & Ohio reports do not give

the *cause* of the accidents reported, but only their nature.

TABLE III.

Percentages of the Various Causes of Casualties to Employés, as shown by various State Reports.

	Massachusetts. 10 yrs. 1873-82.		New York. 2 yrs. 1883 4.		Michigan. 3 yrs. 1882-4	1 yr. 1884.	Iowa. 2 yrs. 1882-3.	4 yrs. 1881-4.
Coupling cars.....	28.2		34.4		41.7	42.7	54.1	33.1
Overhead bridges, etc	8.7		5.8		4.3	4.3	1.9	
Train accidents....	11.2		5.4		9.7	9.2	3.7	
Falling from trains					10.3	10.4	11.6	66.9
Getting on and off trains.....	23.5		20.2		6.2	7.1	5.4	
Miscellaneous	28 4		34.2		27.8	26.3	23.3	
Total.	100.0		100.0		100.0 (of which, not due to train, engine or cars)	100.0	100.0	100.0
	(of which, trainmen)							
	75.4	74.2			6.7	9.0		
Ratio killed to injured....	(1 to 1.76)	(1 to 3.10)			(1 to 4.50)	(1 to 5.44)	(1 to 5.2)	(1 to 4.02)
Ratio of casualties from train accidents to those from coupling..	(1 to 2.52)	(1 to 6.38)			(1 to 4.61)	(1 to 4.64)	(1 to 14.6)	

The miscellaneous causes include accidents from frogs (which in Michigan cause some 4½ per cent. of the casualties), unnecessary presence on the track, failure of bridges, etc., etc.; and also an especially significant subdivision, which in New York state only is given separately, of accidents to employés *not* due to nor in any way connected with the handling of trains, which amounts, in New York, to only 6.7 to 7 per cent.

It is to be remembered, also, that in all classes of accidents to employés only a small proportion of them arise from other causes than train service. In New York state, where injuries appear to be most faithfully reported and where alone "casualties not caused by trains, engines or cars" are separately reported, they amount to only 7 per cent. of the total casualties to employés, if the reports be correct, this including all the large possible classes of accidents from shop machinery and from handling rails, ties, derricks, timber, car wheels and other heavy articles.

Let us see what light is afforded by the data given as to what the real number of car-coupler accidents is. If there be any conclusion which would seem to be justified from the table of state reports above, it is that the proportion of reported casualties to employés from coupling accidents is *not less* than four times that from train accidents, and probably considerably more, for reasons clear in the last line of the table.

Now, in the past three years in our train accident records, which are necessarily incomplete, have shown the following accidents to employés *due to train accidents only*:

	1882.	1883.	1884.	Average.
Killed	276	341	300	306
Injured	805	931	744	827
Ratio of killed to injured.....				1 to 2.71

Naturally, the slight injuries are not so fully reported as the serious ones, and the deaths in this record are in even greater proportion than in the state reports.

Not allowing for the omissions in our records, and assuming that it includes *all* employés killed or seriously injured in train accidents, we have for the number of similar injuries from coupling accidents: 1,133 × 4 = 4,532. The number of deaths only from coupling cars averages in several states almost precisely the same as the average of the New York reports for the past three years, which gives the deaths from coupling and train accidents in the ratio of 1.5 (1.49) to 1.

This gives:

	Killed.	Severely injured.	Total.	Ratio of killed to injured.
In train accidents.....	306	826	1,132	1 to 2.71
In coupling cars.....	459	4,073	4,532	1 to 8.9

The indications are, as we have already seen, that the slighter injuries would bring up the ratio of injured to killed to something like 0 to 1, as in the 4 Baltimore & Ohio and Lake Shore experience. Doing this, and distributing the various injuries, as respects their nature and severity, about in the proportion of the Baltimore & Ohio experience, we obtain, as the appalling totals of the apparent annual injuries to employés from coupling cars in the United States, 459 killed, 4,080 severely injured and 13,770 not seriously injured, or **18,309** in all—one-half more than the casualties to the United States army in the great battle of the Wilderness, though the number killed is not one-fourth as great.

However far the figures so reached may vary from the actual ones, there is no doubt whatever that the number killed in coupling cars is large, and the number crippled very great indeed—so great that the railroad companies should make a determined effort to obviate them, and if necessary give to it the time and energies of their best men and large expenditures of money.

The Result of the Car-Coupler Trials.

The account of the trials at Buffalo which we print on another page shows that they were systematically and methodically conducted, and that the couplers were not subjected to any tests of undue severity, but were treated much as they would be in ordinary service. The manner in which the tests were conducted appears to have given universal satisfaction, and to have reflected much credit on Messrs. Wilder, Wall, Cloud and Lentz, who more especially directed and had charge of the tests.

The committee, after nearly six hours' deliberation, decided to recommend 12 couplers for further practical trial, it being understood that at least 50 cars fitted with each kind of coupler will be equipped forthwith. Their behavior in actual service is to be carefully noted, and will doubtless guide the committee in making a further and possibly final recommendation as to the best coupler or couplers at the next Master Car-Builders' Convention.

Where 42 couplers are tried and but 12 find favor in the eyes of the judges, the representatives of the other 30 naturally feel aggrieved. This was to be expected in any case, but in this particular instance, some of the rejected ones appear to have some reason for complaint. They stated, and correctly, that while their particular coupler went through the trials without a hitch, and was, moreover, largely used on several railroads in different parts of the country, other couplers which did not pass through the tests satisfactorily, and were new, and little known and less used, were nevertheless recommended for further trial.

The selection made is capable of an easy and simple explanation. The committee find certain new and comparatively untried couplers brought before them. Some of them contain very promising features, but at present their performance is not quite satisfactory. The committee acted on the principle of giving these new-comers a chance of showing what they can do. If these inventions have merit, they have now some time in which to prove it in actual service. If they have faults, they have an excellent opportunity to correct them. The tests under uniform conditions have shown many inventors the weak points of their couplers, and those who are wise enough to learn the lesson, and not rest until they have discovered and applied the proper remedies, will stand a fair chance of being among the chosen few when the committee make their next report.

Another class of couplers which have been well known for some time and are in somewhat extensive use, have been omitted from the list of those recommended for further trial. It seems highly probable that the committee considered that these couplers were already undergoing the sort of practical test which they suggest the more recently introduced couplers should now undergo.

It would seem to be a mistake to suppose that the 12 selected couplers are the best that can be found. The practical tests are calculated to answer this question, and apparently there is still an excellent chance of success both for those within and without the chosen 12. It rests with the inventors and practical railroad men connected with the couplers to improve and perfect their working. They now know most of the leading conditions which a coupler must fulfill, and many of them are but too painfully aware how far short their own coupler falls of answering the diverse but essential requirements.

The Restoration of Trunk-Line Rates.

At last the Eastern trunk lines have gone to work seriously to make remunerative the through traffic of their own roads and those of their western connections, in which many millions of dollars of profits have been sacrificed within the past twelve months. These lines alone can advance rates, and on a large part of the business they have all the necessary power. For the rest their coöperation was necessary, and apparently their coöperation alone was needed to make the business as profitable as the circumstances of the times will permit. There is every indication that all parties are thoroughly in earnest, and if so, they will surely find means to maintain the advanced rates which have already been ordered. At their meeting last Tuesday nothing more could be done than to order an advance in west-bound rates, and request their western connections to advance east-bound rates, and make preparations for an agreement by which rates can be maintained. All this was done. West-bound rates were advanced about to the basis of the tariff of July 1, 1882, and January, 1885, which is about one-fifth less than what may be called the standard tariff. The new tariff and the one which it supersedes are, in cents, per 100 lbs.:

	Class. 1.	2.	3.	4.	5.
Tariff of					
Oct. 5	60	50	40	25	20
June 1	40	30	25	18	15

The western lines ordered a restoration of the east-bound rates next Monday to the tariff of July 13, the latest regular tariff, by which the rate on grain and flour from Chicago to New York is 20 cents per 100 lbs.

The trunk-line presidents also instructed the Trunk-Line Executive Committee (consisting of vice-presidents in charge of the traffic departments) to take up the question of a "plan for the establishment and maintenance of rates," and report it to the presidents, and also to report at an adjourned meeting next Thursday, Oct. 1, "a plan for the restoration to full rates of all classes of passenger fares and their proper maintenance." This work is now going on, and, in fact, has been in large part done in previous years, so that it is not likely to be very formidable, though, we may be sure, not devoid of difficulty.

In matters of this kind all depends on the dispositions of the men who control the railroads which cooperate. There was every appearance last Tuesday that all the trunk-line presidents there present were determined to use all their power to carry out the purpose there expressed. All the old companies were represented by their presidents except the Grand Trunk, for which Mr. Hickson, the General Manager, acted as usual. The presidents of the Lackawanna and the Lehigh Valley and the General Manager of the West Shore were specially requested by resolution to attend next Thursday's meeting.

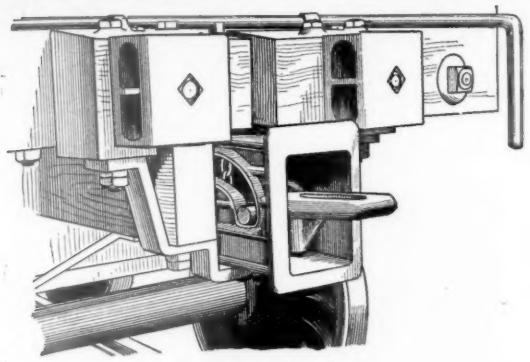
There is every reason to suppose that this effort to restore rates will be successful. There has not been at any time since the reductions began anything in the business conditions which required the great sacrifice of profits that was made, though it would not have been possible to collect high rates. The sacrifice has evidently been a deliberate one, intended by the New York Central and the Pennsylvania to protect themselves from future permanent losses, which, in the long run, would have been more harmful. The objects aimed at, so far as can be seen, have now been attained, and the companies are now ready to make the best of the situation, while heretofore they have been making the worst of it. The situation will not permit of very large profits now, but it will permit a very great improvement over what has been secured for a year past by the Eastern trunk lines and many thousands of miles of their western connections. For most of the railroads north of the Ohio and the Potomac and east of Chicago and St. Louis, the restoration of through freight and passenger rates to a reasonably remunerative basis will be of very great importance. Some of them, very likely, will be saved from bankruptcy by it.

The West-bound Freight Movement.

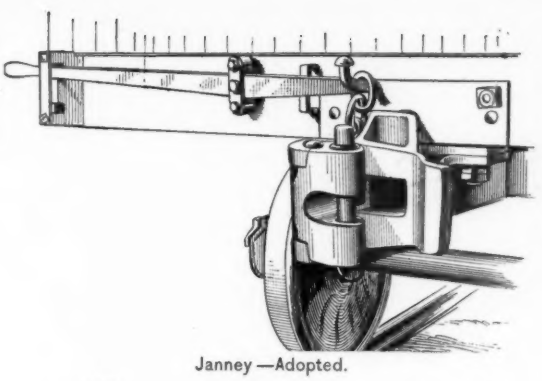
The difference between the effect of a reduction in west-bound rates this year and in 1881 is astonishing. We have compared it for earlier months, but the figures for August are especially significant, because August was the month when the reduction of rates began in 1881. The reduction then, however, was only about 30 per cent., while this year rates were 45 per cent. less than last year. Taking New York, Philadelphia and Baltimore together, their shipments in the first half of the year, in July and in August were in the four years, compared:

	1885.	1884	P. c. of inc. or dec.	1881.	1880.	P. c. of inc. or dec.
Six mos. to June 30.	789,478	808,706	— 1.4	751,509	798,414	— 6.0
July.....	138,893	127,077	+ 9.3	119,774	120,855	— 0.9
August...	148,198	144,227	2.7	180,500	140,948	+28.0

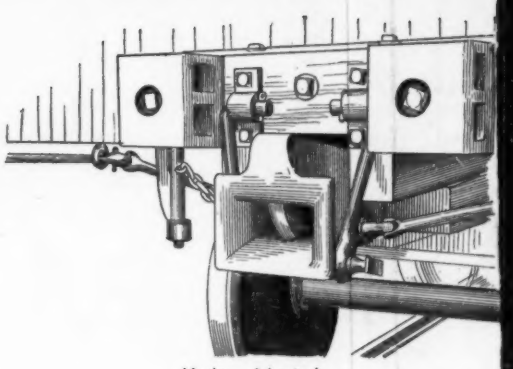
It must be borne in mind that in 1881 rates were the same as in 1880 until August, while in 1885 rates were about 30 per cent. less than in 1884 until June 1, when a further reduction made them about 45 per cent. less. In 1881 we see that shipments were slightly less than in 1880 until the reduction of rates, when they at once increased 28 per cent., and we may add that the increase later in the year was even greater, averaging more than 40 per cent. at New York and Philadelphia. Now this year we see that with a difference in rates, compared with the previous year, as great as after July in 1881, the shipments in the first six months were slightly less than last year—in July 9¼ per cent., and in August only 2¾ per cent. greater than last year. That is, a reduction of 30 per cent. in rates increased rail shipments 28 per cent. in August, 1881, while a decrease of 45 per cent. in rates increased rail shipments only 2¾ per cent. in August, 1885. This shows that traffic is much less elastic now than in 1881, and indicates either that there was very much less canal traffic that could be diverted to the railroads by low rates, or that the ordinary rail traffic was much less than last year. Probably the failure of railroad traffic to increase materially is due to both causes. There is now very little traffic by any route in some articles which the canals carried in 1881 until rail rates were reduced—especially imported iron.



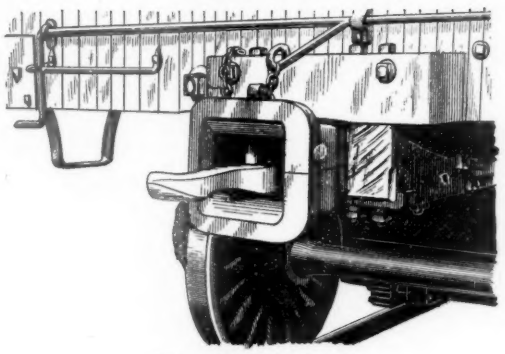
Ames.—Adopted.



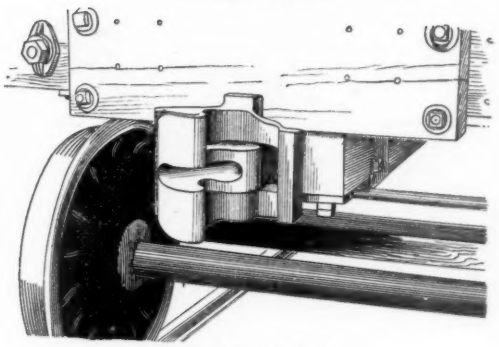
Janney —Adopted.



Marks —Adopted.



Fitzgerald & Van Dorn.



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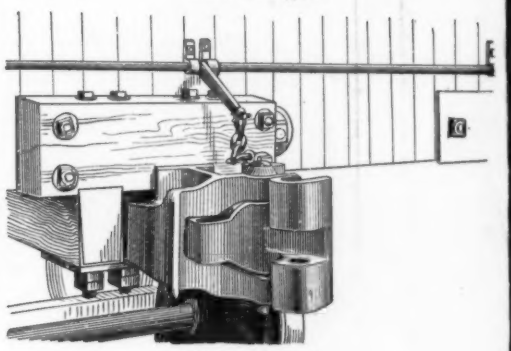

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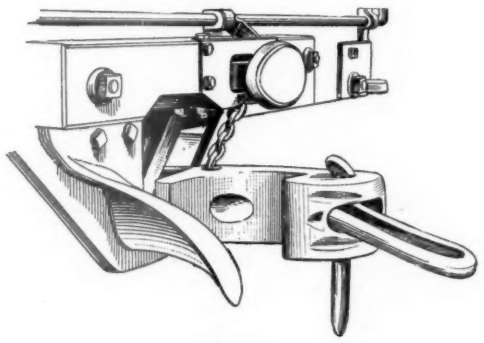
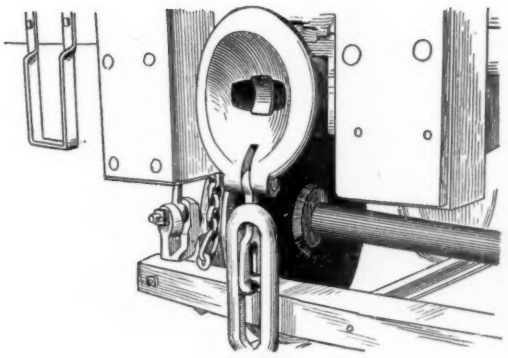


Hitchcock.



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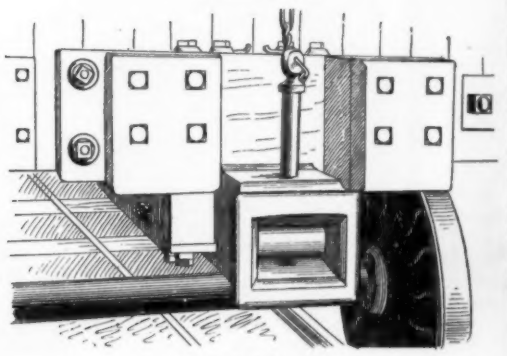
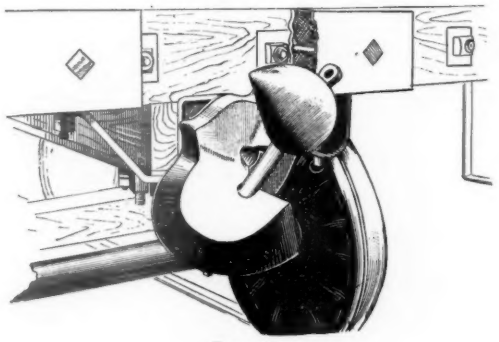


Russell's Eccentric.



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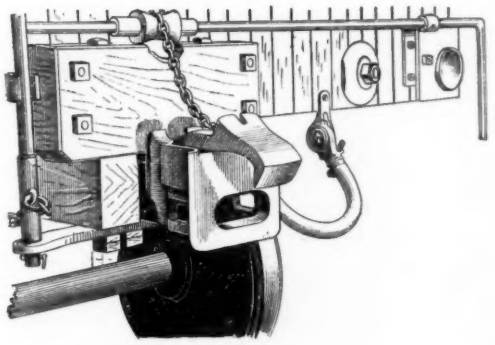

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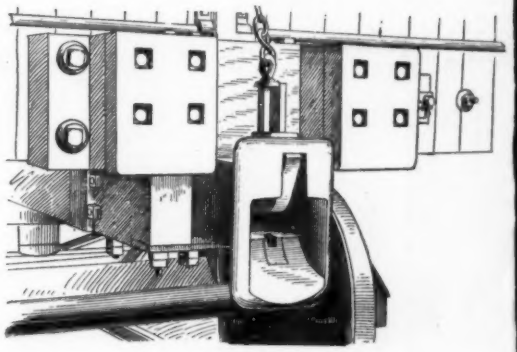
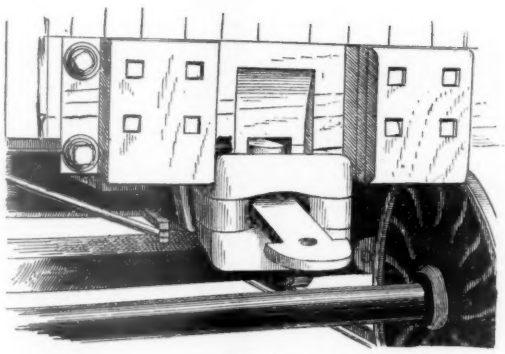
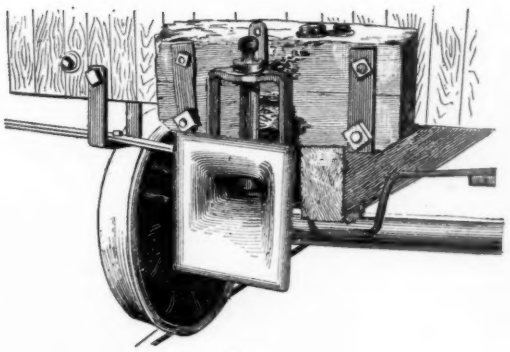


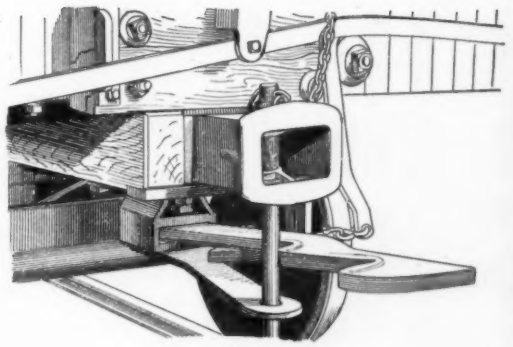
United States.



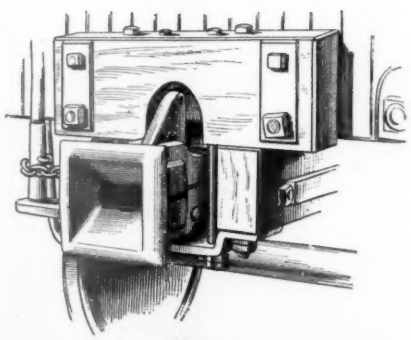
Murphy.



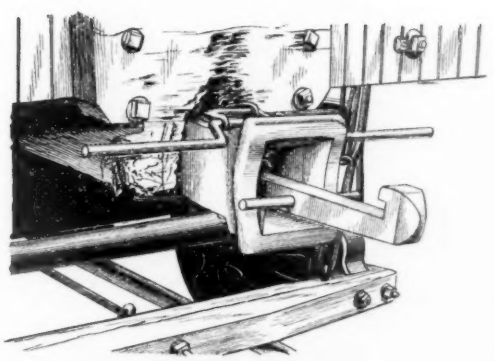
Curry.



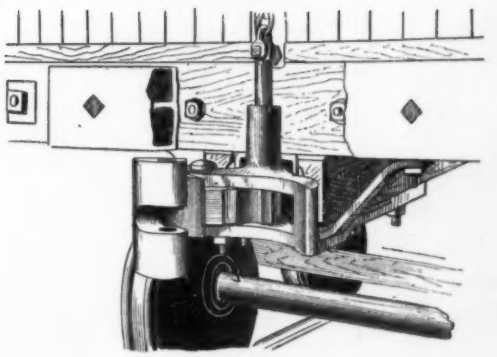
Barnes.



McCree.

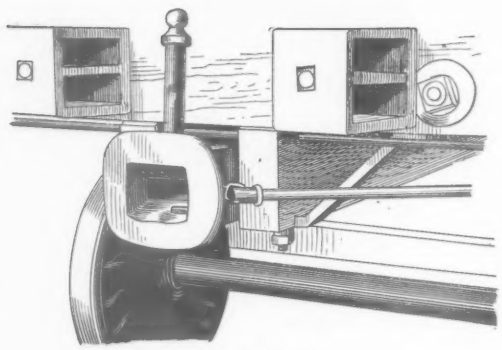


Le Roux & Van Aarle.

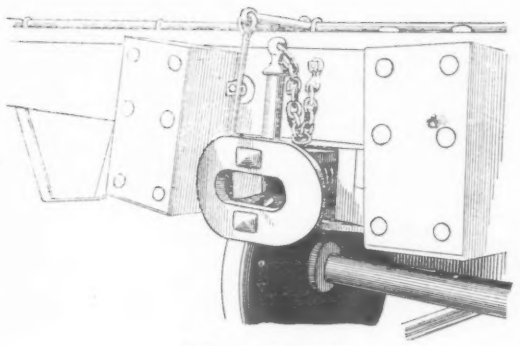


Simpson's.

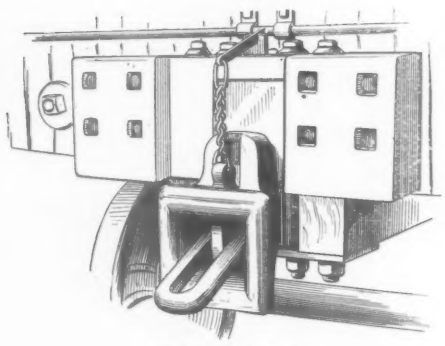
THE AUTOMATIC CAR COUPLERS TESTED AT BUFFALO,



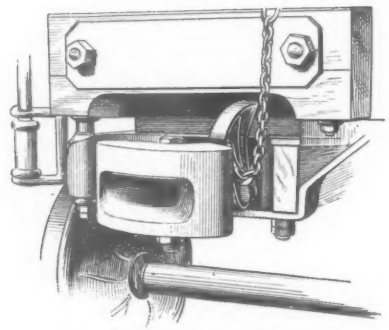
Perry.—Adopted.



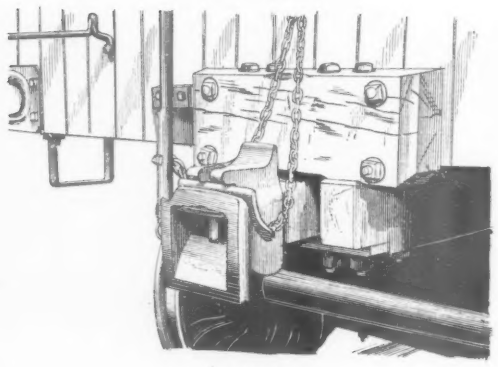
McKeen.—Adopted.



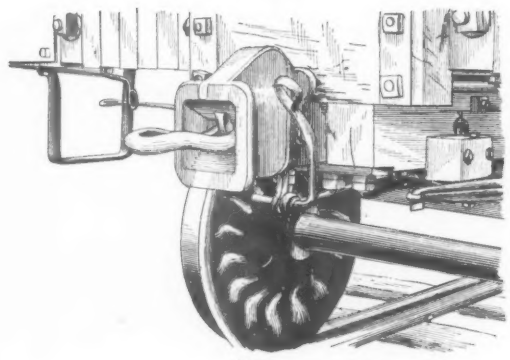
Gifford.—Adopted.



Titus & Bossinger.—Adopted.



Lancaster.



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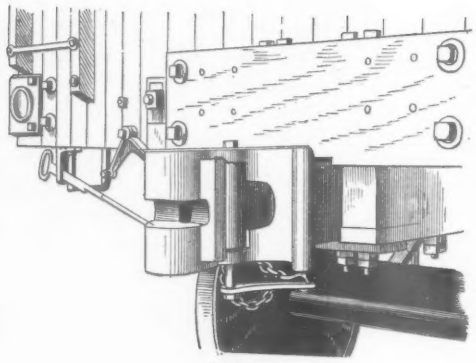

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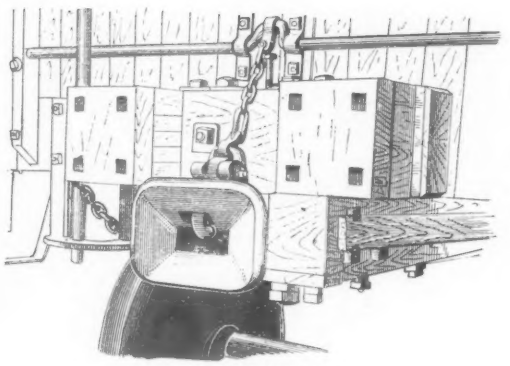

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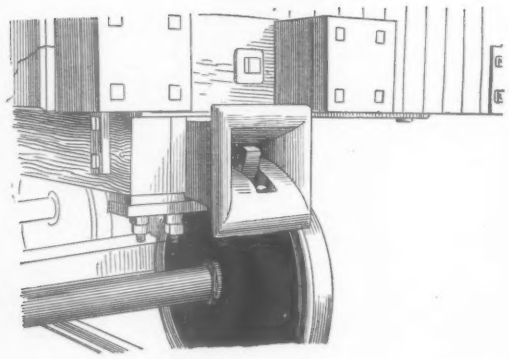

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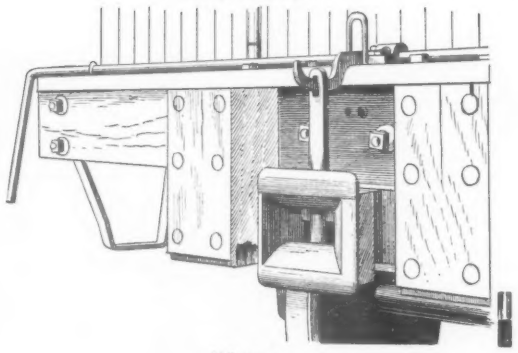

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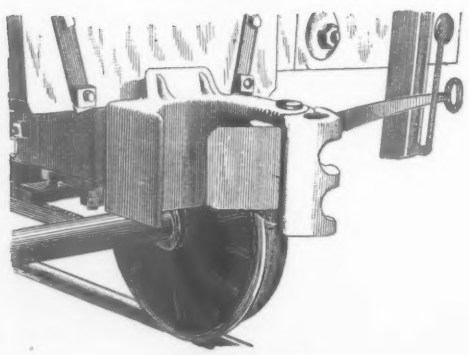

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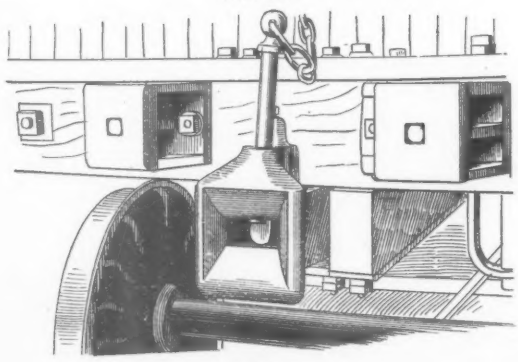
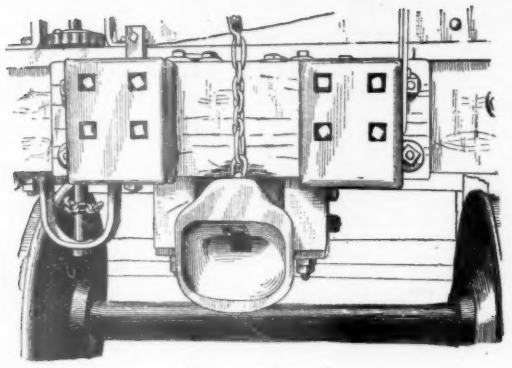
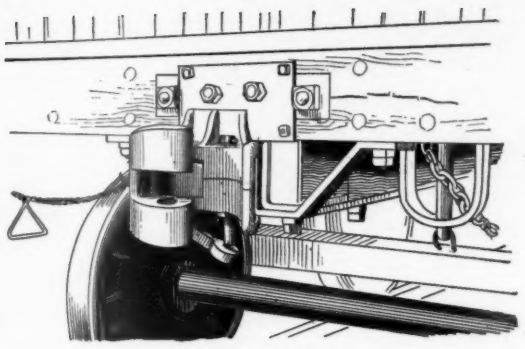


Bird.

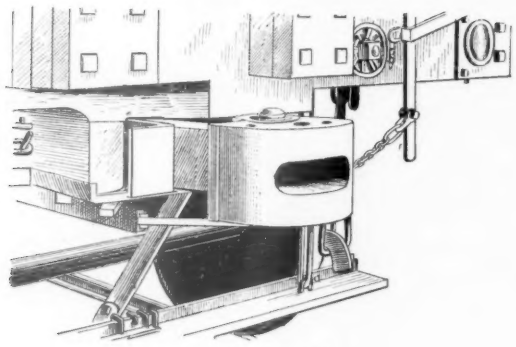
UFFALO, SEPT. 15-17, 1885, BY THE EXECUTIVE COMMITTEE OF THE MASTER CAR-BUILDERS' A



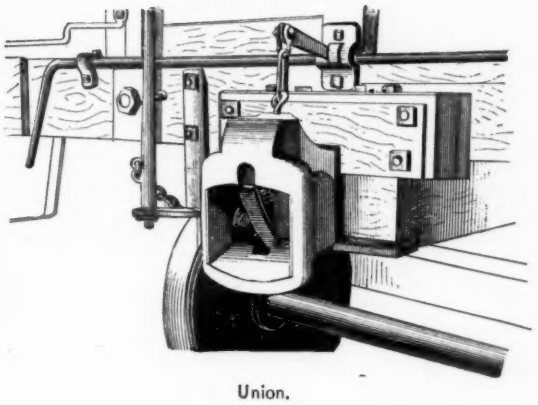
Archer.—Adopted.



Dowling.—Adopted.



Cowell.—Adopted.



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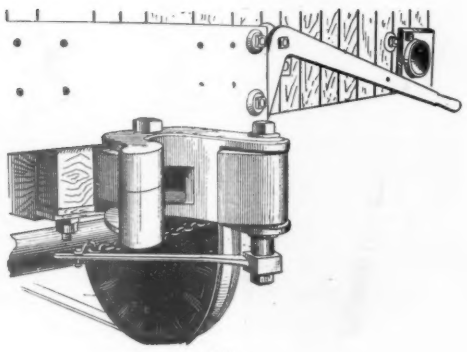

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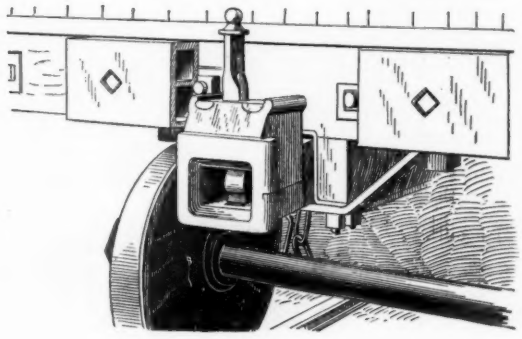

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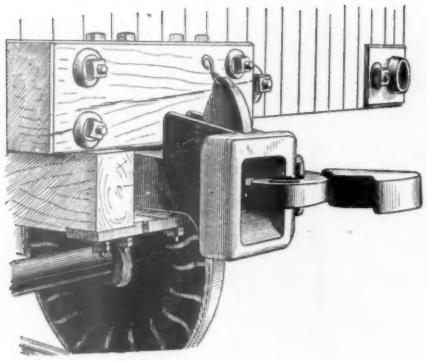

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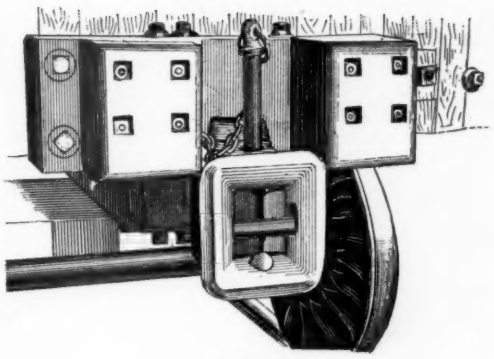
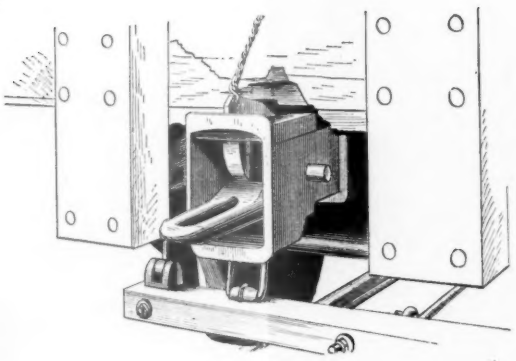
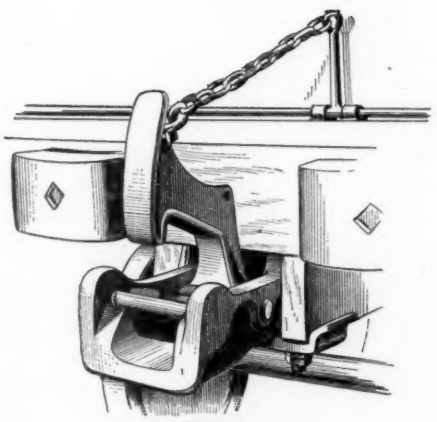


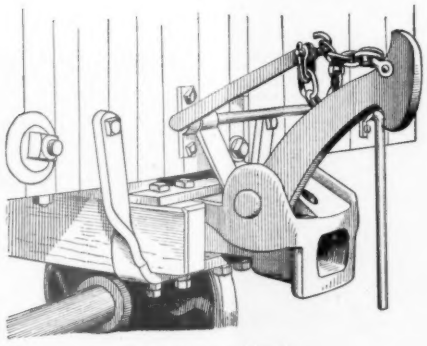
Brown.



Stanford.



Morgan.



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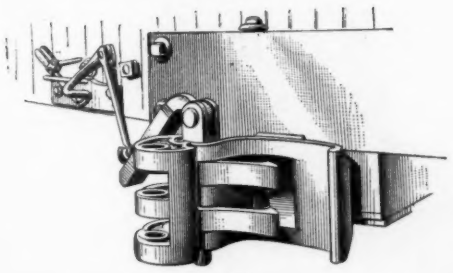

Joo.

The aggregate August shipments from these three ports for seven years have been, in tons :

1879.	1880.	1881.	1882.	1883.	1884.	1885.
107,579	140,948	180,500	167,485	148,161	144,227	148,228

Thus the total movement of the month from the three cities was not 3 per cent. more this year than last, and nearly the same as in 1883, while 11¼ per cent. less than in 1882 and 18 per cent. less than in 1881, 5¼ per cent more than in 1880. The whole of the gain over last year was at New York, probably because there only is there any canal traffic to be diverted. Compared with 1880, the year of maximum shipments, there is a decrease of 20 per cent. at New York, 21 per cent. at Philadelphia and 40 per cent. at Baltimore, which latter port has probably suffered more than the other places from the cessation of importation of scrap iron, rails, etc.

For the eight months ending with August the shipments of these ports have been :

1880.	1881.	1882.	1883.	1884.	1885.
1,061,219	1,051,783	1,357,896	985,751	1,080,010	1,075,569

It must be remembered that during six of these months in 1882 rates were just about as low as they have been during the last three months of this year. But the low rates then stimulated shipments wonderfully, making them 29 per cent. more than in 1881, and 28 per cent. more than in 1880. This year, with rates for five months 30 per cent. less and for three months 45 per cent. less than last year, the shipments have not increased at all, but have been substantially the same as last year, and also nearly the same as in 1880 and 1881, but 20¾ per cent. less than in 1882, and 9 per cent. more than in 1883. If rates had been remunerative, the traffic this year would have been reasonably satisfactory, but with the great reduction of rates it is very unsatisfactory, not only because of the small earnings, but also because it shows so unfavorable a condition of business that a reduction of cost has scarcely any effect on the movement of goods.

The Northern Pacific Report.

The report for the year to June 30 last covers the first full year of the completed transcontinental line, which was opened for business about Oct. 1, 1883. The line was completed when business and immigration had already begun to fall off, but the traffic of the year to June 30, 1884, profited greatly by the rush to the Cœur d'Alene mines in the spring of that year, so that the income exceeded the charges by more than a million dollars. The dullness in business continued last year ; and though on this road the crops were much the largest ever grown, the price of wheat, the chief crop, was so low that immigration was discouraged, and the speculative activity, which did much to increase the traffic before 1884, was pretty well extinguished. The course of things is what it almost always is in a new country, dullness following the first rapid growth ; but meanwhile, though fewer people buy land than formerly, the area under cultivation is increased every year. What we have said elsewhere of the low price of wheat checking the growth of the country on the St. Paul & Manitoba Railroad, is true also of the Northern Pacific, which, however, does not so much depend upon that crop, having a great grazing and mining industry on its line, both of which are prospering.

Under ordinary circumstances, whatever the future course, the earnings of such a road would almost certainly be considerably greater in the second year after its opening than in the first. But the Northern Pacific last year had a *decrease* of 10¾ per cent. in its gross earnings. An analysis of them, however, shows that this decrease was due to the exceptional large receipts from the Cœur d'Alene business last year and to the decrease in earnings from construction and other company material. In the earnings from other freight there was a small increase last year ; and of the large reduction in passenger earnings nearly three-fourths was in the three spring months of the rush to the Cœur d'Alene. Further, for part of the year, the through traffic was shared with the Union Pacific.

The effect of the large crops is seen in an increase of 51½ per cent. in the east-bound freight movement : that is certainly a satisfactory growth. The transcontinental movement eastward is comparatively small. In west-bound freight, however, there was a decrease of 26 per cent., due chiefly, probably, to the smaller amount of construction material, but partly, probably to the diversion of transcontinental freight (which is considerable in this direction), by the Union Pacific. The total freight traffic decreased from 400 to 391 millions of ton-miles, or 2¼ per cent. Meanwhile passenger traffic decreased from 116 to 85 millions of passenger miles, or 26¼ per cent., about seven-tenths of the decrease being in the westbound movement. The passenger movement in the two directions is of especial interest, as giving some clew to the growth of population on the road, the immigrants being nearly all from the East. In 1883–84 it carried 32,636 more people west than east, last year only 2,434 more went west than east. There was an addition of some branch roads during the last year, and also an addition to the debt and to the fixed charges. The expenses were so much reduced (16¼ per cent.) that while the decrease in gross earnings was $1,369,426, the decrease in net earnings was but $388,000 (7 per cent.) ; but the increase in interest, rentals, etc., was $690,000. The result was that the surplus over charges of $1,055,656 in 1883–84 was reduced to $91,960 last year —a painfully close margin for a railroad company with a capital of $167,000,000, amounting to about 10½ cents per share of stock.

The decrease in working expenses is so very large as to attract attention. In "motive power" expenses the decrease was 21 per cent.; in maintenance of road and structures 21¼, in maintenance of cars only 2¾. The average expense per mile for road and structures was $546. For road-bed and track repairs the expenditure was $301 per mile ; for rail renewals, $22 ; for tie renewals, $30. For repairs of locomotives the average expense was $736 each, against $1,590 the year before ; per freight car the expense was $33 ; per passenger-train car, $643. This indicates that expenditures were kept down to the minimum, and that there is no room for further savings in that direction.

With the slight margin over charges last year, the sales of the company's lands became more important. These have fallen off, but are still large and yield a large income to the company. Last year the sales amounted to $1,682,730. Most of the land is bought with preferred stock, however, which is accepted for all lands east of the Missouri. More than $3,230,000 is due the company for land sold ; the money as it comes in is devoted to retiring bonds of the company, but if net earnings do not suffice, can be devoted to paying interest.

The interest charges of the company will be larger this year than last by about $625,000, provided no additions are made to the funded debt. As the surplus was but $92,000 last year, there must be a considerable increase in the net earnings to meet these additional charges. If wheat were selling at $1.25 a bushel in Duluth, instead of 88 cents, there would be a much better prospect of such an increase than there is now.

The receipts of grain and flour at New York in August were 40 per cent. more than in July, and about the same as in June, and 13½ per cent. more than in August last year, and also more than in 1883. The railroads brought a somewhat smaller share than in July of this year, and nearly the same share as in the corresponding month in 1884 and 1883. In the receipts by different railroads the New York Central has an unusually large share—43.6 per cent., as against 37.8 per cent. in the previous seven months, 38.5 in August last year and 33.2 in 1883. The Erie's share is somewhat above its average in previous months of this year, and also the Pennsylvania's, the two new roads taking much less than usual—together 8.9 per cent. of the total rail receipts, against 14.6 in July, 18.4 in June, and 19.2 in the seven months ending with July. This was not so much due to the abandonment of the business by the West Shore, which might have been expected under the circumstances, but more to the Lackawanna, which brought but three per cent. of the whole. Considering the very low rates, the performance of the canal is most remarkable, as it delivered a third more than in July, nearly as much as in August last year, and about the same as in 1883. If we take grain alone, excluding flour, we find that the canal and the coasting vessels brought 48¼ per cent. of the whole, in spite of the low rail rates.

August Accidents.

Our record of train accidents in August, given on another page, contains brief notes of 38 collisions, 50 derailments and 4 other accidents; a total of 92 accidents, in which 37 persons were killed and 172 injured.

Nine collisions, and 14 derailments caused the death of one or more persons ; 14 collisions, 9 derailments and 1 other accident caused injury but not death. In all, 23 accidents caused death and 24 lesser injuries, leaving 45, or 49 per cent. of the whole number, in which there was no injury serious enough for record.

The 38 collisions caused 12 deaths and 96 injuries; the 50 derailments killed 25 persons and injured 75, while in the 4 other accidents only 1 person was hurt.

Twenty-eight of the persons killed and 52 of those injured were railroad employés, who thus made up 76 per cent. of the killed, 30 per cent. of the injured and 38 per cent. of the whole number of casualties.

As compared with August, 1884, there was an increase of 3 accidents, a decrease of 1 killed, and an increase of 60 persons injured.

These accidents are classed as to their nature and causes, as follows :

COLLISIONS:		
Rear	23	
Butting	11	
Crossing	4	
		— 38
DERAILMENTS:		
Broken rail	1	
Broken switch-rod	1	
Broken bridge	4	
Spreading of rails	2	
Broken wheel	1	
Broken axle	6	
Broken brake-beam	1	
Accidental obstruction	2	
Cattle on track	6	
Land-slide	2	
Wash-out	5	
Misplaced switch	5	
Open draw	1	
Malicious obstruction	1	
Unexplained	1½	
		— 50
OTHER ACCIDENTS:		
Broken eccentric-strap	2	
Broken parallel-rod	2	
		— 4
Total		92

Five collisions were caused by trains breaking in two ; three by misplaced switches ; one each by a mistake in orders, by a runaway car, by a car left standing on main track and by carelessness in leaving cars projecting over on main track from a siding.

Of the four broken bridges, two were ordinary wooden trestles ; of the other two nothing could be definitely stated except that both were wooden bridges, and one of them had been standing a long time.

A general classification of these accidents may be made as follows :

	Collisions.	Derailments.	Other.	Total.
Defects of road	..	8	..	8
Defects of equipment	5	8	4	17
Negligence in operating	32	6	..	38
Unforeseen obstructions	1	15	..	16
Maliciously caused	..	1	.	1
Unexplained	..	12	..	12
Total	38	50	4	92

Negligence in operating is thus the chief cause, being charged with 41 per cent. of all the accidents. Defects of equipment account for 18½ per cent., defects of road for 9 and unforeseen obstructions for 18 per cent.

A division by classes of trains and accidents is as follows :

Accidents:	Collisions.	Derailments.	Other.	Total.
To passenger trains	3	15	3	21
To a pass. and a freight	11	..	..	11
To freight trains	24	35	1	60
Total	38	50	4	92

This shows accidents to a total of 130 trains, of which 35 (27 per cent.) were passenger trains, and 95 (73 per cent.) were freight trains. Construction and service trains are included with freight.

Of the total number of accidents 60 are recorded as happening in daylight and 32 at night.

Misplaced switches caused eight accidents in all, five derailments and three collisions, thus furnishing almost their usual proportion. Only one malicious derailment is recorded.

The most prominent cause of collision is the breaking of trains in two, indicating that in the measures now on foot for the improvement of freight car couplings attention should be paid to the strength as well as the safety of draw-gear.

There has, fortunately, been an almost total absence this year of the accidents to excursion trains which have usually formed a feature of the month. This may be due partly to increased care, and partly, perhaps, to the fact that excursion and pleasure travel has this year been light almost everywhere, even those lines which depend largely on this kind of business reporting smaller returns than usual from it.

The accidents incidental to the season, such as wash-outs from sudden and violent storms and those resulting from cattle on the track, appear in about the usual number. August generally shows more accidents than any other summer month; this year it is no exception to the rule, although it has been exceeded by the same month in many previous years during which this record has been kept.

For the year ending with August the record is as follows :

	Accidents.	Killed.	Injured.
September	100	21	174
October	105	39	170
November	96	47	130
December	105	24	109
January	145	24	182
February	216	44	259
March	86	17	84
April	81	14	75
May	92	8	65
June	75	24	115
July	76	28	75
August	92	37	172
Total	1,239	327	1,610
Total, same months, 1883–84	1,351	411	1,942
" " " 1882–83	1,636	466	1,754
" " " 1881–82	1,323	407	1,558

The monthly average for the year was 103 accidents, 27 killed and 134 injured, August being below the average in accidents, but above it in killed and injured. The yearly average for the four years was 1,387 accidents, 403 killed and 1,716 injured, last year being below the average in all points.

The averages per day were, for the month, 2.97 accidents 1.19 killed and 5.55 injured; for the year, 3.39 accidents, 0.90 killed and 4.41 injured.

The average casualties per accident for the month were 0.402 killed and 0.870 hurt; for the year they were 0.264 killed and 1.299 injured.

August was above the average in the number killed, and

also had a pretty heavy list of injured. It may be noted, however, that a large portion of the injuries were slight, some of them probably mere bruises, though this is always a difficult matter to determine from the accounts received of o st acci dents.

The 14 railroads reporting their August earnings this week are all (except the Pennsylvania) small, and mostly Southern roads. In the aggregate, their earnings have decreased from $5,882,842 to $5,154,699, or 12¼ per cent., more than nine-tenths of the decrease being by the Pennsylvania Railroad. Six of the 14 had an increase in earnings, the most important of which are 17½ per cent. by the Fort Worth & Denver, 13¾ by the South Carolina and 10¼ by the Belleville Line of the St. Louis & Terre Haute, which forms part of one of the principal routes between St. Louis and the South. The larger decreases are 10 per cent. by the Alabama Great Southern, 22½ by the Cincinnati, Washington & Baltimore, 19¼ by the Des Moines & Fort Dodge, 16⅝ by the Nashville & Chattanooga, and, greatest of all, 14¼ by the Pennsylvania.

The aggregates of 64 railroads that have reported for August so far are :

	1885.	1884.	Decrease.	P. c.
Earnings.....	$22,379,046	$23,822,667	$1,443,621	6.0

Nearly one-half of the whole decrease is by the Pennsylvania, which has not before had so great a fallling-off. There was at the same time a decrease in the net income of its Western system, amounting to $412,006, and this, added to the decrease in net earnings of its Eastern system ($502,485), amou.ts to a falling-off in income in this single month of $914,501—nearly 1 per cent. on the stock.

Chicago shipments eastward for the week ending Sept. 19, including only flour, grain and provisions this year, but all freights in previous years, have been, in tons :

1880.	1881.	1882.	1883.	1884.	1885.
33,844	63,855	35,611	44,296	34,159	52,161

Thus the shipments this year were larger than in any other except 1881 and 53 per cent. more than last year, the rates being about half as high and producing smaller gross earnings than in any other year and no net earnings whatever.

For six successive weeks the total Chicago shipments and the percentage going by each railroad have been :

	Week ending.					
	Aug. 15.	Aug. 22.	Aug. 29.	Sept. 5.	Sept. 12.	Sept. 19.
Tons :						
Flour.....	1,826	2,077	2,592	2,182	3,913	4,990
Grain..... ...10,737	20,881	20,870	22,835	30,986	35,308	
Provisions.	8,147	10,341	7,840	10,005	13,262	11,863
Total 20,710	33,299	31,302	35,022	48,161	52,161	
Per cent.:						
C. & Grand T ..	10.0	12.4	17.1	8.1	5.2	6.9
Mich. Cen	23.8	18.5	13.3	19.2	20.7	25.3
Lake Shore.....	7.1	13.5	10 9	19.7	22.5	19.7
Nickel Plate	13 8	18.0	16.2	9.7	11.9	8.8
Ft. Wayne.	15.4	14.1	13.3	14.9	11.4	15.6
C., St. L. & P.....	12.5	8.3	7.9	9.5	12.2	12.5
Balt. & Ohio.....	7.3	6.3	8.6	6.1	6.7	5.2
Ch. & Atlantic..	10.1	8.9	12.7	12 8	9.4	6.0
Total..... ...	100.0	100.0	100.0	100.0	100.0	100.0

The total shipments last week were 8.3 per cent. more than the week before, the flour shipments increasing 27 per cent., the grain shipments 14 per cent., and the provision shipments decreasing 10½ per cent. The general course of percentages is similar to that of the week before, only the Vanderbilt and the Pennsylvania roads carrying much. The three Vanderbilt lines took 53.8 per cent. of the whole, against 55.1 the week before, while the two Pennsylvania roads carried 28.1 per cent., against 23.6 the week before. The latter took 48 per cent. of the provisions, and the Chicago & Grand Trunk, which often leads in these shipments, carried but 9.2 per cent. of them, and stood fourth. It is said that rates were lower for provisions than for grain, and the indications are that there was unusual competition for them, though there can have been no profit in carrying them.

It should be remembered that these reports give few or no shipments made on Saturday, and that Saturday, Sept. 12, was the day of lowest rates, so that, though perhaps rates averaged higher on grain last week than the week before, the shipments reported for last week were those made at the lowest rates. Moreover, a very large part of the total shipments in any week consist of freight billed the week before at points further west. Rates last week were so low, however, that it is doubtful if any further reduction would stimulate shipments. The arrivals at Chicago are small, indicating that farmers have not been induced to ship by the low rates, and as they are insured low water rates for some time yet, there is no reason why they should be.

The movement of grain of all kinds to the Northwestern markets culminated last year in the week to Oct. 4, but was then not much larger than in the week to Aug. 16. This last named was the culmination of the winter wheat movement, while it was spring wheat and corn that made the later movement heavy. So far this year there has been no week when the Northwestern receipts were as much as 7,000,000 bushels, while last year after Aug. 9 there was no week in which they were so little. The winter wheat had its greatest effect this year and last in the second week of August, but the receipts of grain of all kinds were then but 6,270,000 bushels this year, against 8,456,000 last year. This year there was a second culmination in the week to Sept. 5, when the receipts were 6,785,600 bushels, the largest this year so far, they having fallen to 6,104,400 the next week. This was due to large corn shipments, however, and we have as yet only begun to feel the effect of the spring wheat crop. It is possible that this and the surplus of old corn together may make receipts hereafter for a time nearly as large as last year. We can hardly expect so much wheat, but there may be more corn.

The grain shipments of the Northwestern markets during the week to Sept. 12, when rail rates were lowest, were not as large as the week before, though there was an increase in the rail shipments :

	Week ending				
	Aug. 15.	Aug. 22.	Aug. 23.	Sept. 5.	Sept. 12.
By rail.....2,320,899	1,622,143	2,290,026	2,834,240	3,141,953	
By lake 2,461,339	2,541,632	2,601,234	3,199,941	2,294,472	
Down Miss. 115,677	148,500	170,969	217,282	89,863	
Total. 4,898,915	4,312,275	5,062,229	6,251,483	5,526 288	

Thus the rail shipments in the week to Sept. 12 were 11 per cent. more than the week before, but the total shipments were 11½ per cent. less, the lake shipments falling off 28 per cent. and the river shipments 59 per cent. The lake shipments, it appears, were by no means destroyed by the low rail rates, but were in fact not much less than throughout August.

The rail shipments of grain from Buffalo increased in the week to Sept. 12, but the canal shipments did not decrease. For five successive weeks they have been :

	Week ending.				
	Aug. 15.	Aug. 22.	Aug. 29.	Sept. 5.	Sept. 12.
By rail....	287,518	174,454	459,238	432,550	619.505
By canal..1,233,400	1,816,176	1,938,040	1,321,667	1,367,292	

The large rail shipments made at Chicago in the week to Sept. 12 will be felt most at Buffalo in the following week, probably.

As indicated last week, there was a large falling off in the receipts of corn at the Northwestern markets in the second week of September, they being then about one-fourth less than the week before and less than in the corresponding weeks of last year and most other years. The shipments were slightly larger than the receipts. For six successive weeks the receipts of corn at these markets have been, in bushels.

Week ending					
Aug. 8.	Aug. 15.	Aug. 22.	Aug. 29.	Sept. 5.	Sept. 12.
1,061,659	1,924,410	2,471,190	2,619,117	2,583,541	1,859,169

Thus the receipts in the last week were the smallest for five weeks.

The new spring wheat, which was faintly felt in the receipts of the Northwestern markets for the week to Sept. 5, is felt very decidedly the following week, especially at Duluth, which received more wheat than any other two markets, but also at Chicago and Milwaukee. Meanwhile the receipts at the exclusively winter-wheat markets fell, but not so much as the spring wheat increased, leaving the total wheat receipts the largest of this year.

Thus the total wheat receipts at the Northwestern markets for six weeks have been:

Week ending					
Aug. 8	Aug. 15.	Aug. 22.	Aug. 29.	Sept. 5.	Sept. 12
1,246,486	2,045,413	1,748,958	1,573,675	1,830,333	2,203,883

Meanwhile the course of receipts at the leading winter wheat markets was:

	Week ending					
	Aug. 8.	Aug. 15.	Aug. 22.	Aug. 29.	Sept. 5.	Sept. 12
St. Louis 263,626	633,969	590,082	479,427	458,743	328,141	
Toledo..... ...376,588	540,820	342,731	236,274	361,980	273,477	
Detroit.....229,261	308,382	427,652	409,458	465,067	314,395	
The three..869,475	1,483,171	1,380,465	1,155,159	1,225,790	916,013	

They culminated, therefore, in the second week of August, and have been growing smaller ever since.

The receipts at the leading spring wheat markets in the same weeks were :

	Week ending					
	Aug. 8.	Aug. 15.	Aug. 22.	Aug. 29.	Sept. 5.	Sept. 12.
Chicago...	201,631	231,098	202,479	200,163	256,456	319,926
Milwaukee	51,282	65,262	31,615	69,460	79,960	138,046
Duluth....	98,379	149,466	91,097	118,893	251,192	807,806
The three.	351.293	445,826	325,191	397,516	587,608	1,265,778

Chicago receives winter as well as spring wheat when the crop is good, and especially when rail rates to the East are maintained, as it goes there then from points far south to get the advantage of lake rates, but it receives very little winter wheat this year. We see that in the aggregate these three markets had their smallest wheat receipts in the third week of August, and that in the week to Sept. 12 their receipts were nearly four times as great, the increase being 787 per cent. at Duluth, 337 per cent. at Milwaukee, and 58 per cent. at Chicago. The spring wheat of Iowa and Nebraska, which is quite as large in amount as that of Minnesota and Dakota, is marketed chiefly at Chicago, and is ready to ship three or four weeks before Duluth begins to have large receipts ; yet we see few signs of it in the Chicago receipts. These states are not in such haste to ship as the country which makes Duluth its market, which aims to market most of its wheat before navigation closes.

The change from the predominance of winter to that of spring wheat is very sudden. Even in the first week of September the three winter-wheat markets received more than twice as much as the three spring-wheat markets ; in the next week the latter received one-third more than the former.

A late issue of the London *Times* contains a long article on the prospects of railroads in China, giving more details than were given in our notice of Aug. 14. It states that "in the prospectus of the last Chinese loan (which is for the considerable sum of 100,000,000 florins, or nearly $50,000,000), special mention is made of these undertakings, and it is no secret that several of the most important mercantile firms in China, as well as other bodies who have less acquaintance with Chinese matters, are at the present time engaged in the task of preparing plans and estimates in connection with these enterprises." The government also is practically committed in favor of railroads, and the opposition to them, at least among the higher class, has notably decreased. A "Manchester firm" is said to have signed a contract to build and work a line from Taku to Tong-Chow, wherever that is, the Chinese government furnishing capital and labor. This statement, however, lacks, as yet, confirmation.

The line which will probably be built first still appears to be that from the coast at Tien-Tsin to Pekin; a distance of only 80 miles, however, instead of 120. Another line, which is considered to be of much promise and is actively pushed, is from Tien-Tsin southward, 600 to 700 miles to Nanking. Still others are some 150 miles, and one, a shorter line, from Nanking to the coast at Shanghai, from Canton northeasterly to Nanking, some 700 miles. The *Times*, however, makes the suggestion that in order to "convince the Chinese *of our unselfish desire* (italics ours) for the introduction of railways into their empire," an inland strategic line from Pekin northeasterly to Mookden, the capital of Manchooria, close to the borders of the Amoor country and Siberia, would be the very best undertaking, "although its advantages would be military and political, rather than commercial." This doubtless is proposed because of the difficulty the Chinese have had in protecting their Russian border, far removed from their centres of population and supply. Doubtless a railroad might help greatly in a war with Russia or other adjacent country, but its advantage would become evident only in case of war, which might not occur for years, if ever; in which case the railroad would be a dead weight all the time, not helping to demonstrate the great and constant economic benefits of such an enterprise, when properly located, which is the thing most needed and probably the only thing needed to open China to railroad construction. It is of the first importance that the first railroads in that country should be of great and manifest public advantage in a part of the country where the benefits will be felt by many and influential people. That and that alone will make the Chinese wish for railroads and lead them to withdraw the obstacles that have heretofore prevented their construction in China. On this account, too, it is desirable that the first lines should not be unduly costly, but that the government, if it supplies part of the capital, should get a good return and the people low rates for transportation. Should this be the case, the Chinese wall against which railroads fight falls on all sides at once, and that populous empire might be opened to foreign capital and enterprise, for which there should be abundant room there if the foreigners will but remember that the railroads must be primarily for the benefit of China, and not engines for the transfer of the wealth of that country to England and America. Unlimited greed on the part of foreign railroad owners might put up the wall against railroads higher than ever, even after it had once been torn down.

Record of New Railroad Construction.

Information of the laying of track on new railroads in the current year is given in the present number of the *Railroad Gazette* as follows :

Fremont, Elkhorn & Missouri Valley.—Extended from Chadron, Neb., northwest 5 miles.

Los Angeles & San Gabriel Valley.—Extended from Pasadena, Cal., east 4 miles.

Pennsylvania.—This company's *Schuylkill Valley* line is extended from Reading, Pa., northwest 7 miles.

Versailles & Midway.—Completed from Versailles, Ky., northeast to Midway, 10 miles.

This is a total of 26 miles on 4 roads, making 1,696 miles thus far reported for the current year. The new track reported to the corresponding date for 14 years past has been :

	Miles		Miles.
1885.....	1,696	1878.....	1,267
1884.....	2,619	1877.....	1,396
1883.....	3,995	1876.....	1,677
1882.....	7,285	1875.....	804
1881.....	4,774	1874.....	1,101
1880.....	3,607	1873.....	2,778
1879.....	2,224	1872.....	4,970

This statement covers *main track only*, second or other additional tracks and sidings not being included.

NEW PUBLICATIONS.

Principles of Economy in the Design of Metallic Bridges. By Charles B. Bender. John Wiley & Sons, New York.

Mr. Bender, who is now living in London, has been long and favorably known in this country as a bridge engineer, and his numerous papers presented in the columns of this journal and in the *Transactions* of the American Society of Civil Engineers, have helped not a little to elucidate some doubtful matters in bridge building. Very few men in this or any other country have studied the theory and practice of bridge construction more profoundly, or are so familiar with the history of the art in all countries. While here, he was characterized by one of our first bridge engineers, himself a thorough student of his art, as the most capable *critic* of bridge construction in the country. He has always been a sturdy advocate of the American types of bridge trusses, and in this volume he gives in some detail the reasons why the Whipple truss, which may be taken as the typical American truss, and which every year becomes more and more nearly universal, "presents almost the maximum attainable economy of the various types of single-span bridges;" although "for small openings, up to about 150 ft., the Pratt truss, but with Whipple's inclined end-posts, diagonals intersecting only one panel, seems to be the most appropriate structure." "Only very lately," Mr. Bender says, "an approach was made in Germany to the Whipple truss with inclined end-posts, and in fact outside of the United states the perfection of this most simple, most serviceable and very economical truss, which

can be adapted to by far the greatest number of different localities, even yet is not sufficiently appreciated."

The dates given by Mr. Bender for the invention of these various types will, perhaps, bear repeating. They are, in order of time, beginning with the first invention of the truss bridge proper: Town lattice truss, 1835; Long truss, 1836; Howe truss, 1840; Pratt truss, 1843; Whipple truss, 1847; Fink truss, 1854; and about the same time the Bollman. Mr. Whipple seems to have been the first engineer who had any real understanding of the theory of truss strains, and to his book, which was the forerunner of such a host, Mr. Bender pays a handsome compliment. The historical data, in respect to these matters, is quite full, and, as the author correctly surmises, of much interest to those interested in bridge-building at all.

We detect nothing especially new in the analyses of, and conclusions as to, these simpler forms of trusses, to which, and to elementary principles, the first 60 pages are devoted; but the manner of presenting the subject is clear, and easily followed. The discussion of these simpler forms of trusses, however, is only a minor feature of the volume, which is expressly held forth to be intended chiefly "to assist those who have to make projects of great bridges, such as arches, cantilever-trusses and arches, and, for the very greatest spans, stiffened wire suspension bridges." Into the details of this vast field, where, as the author truly says, so much is as yet unsettled, and where, as he does not say, there is so much which different engineers, each for himself, has positively settled to his own satisfaction, in a different way from others, it would be profitless for us to follow him; further than to say that the mathematical argument is much more easily followed than is usual in works of the kind, and that the conclusions in every detail are, as fully as could be expected, definite and positive. It is doubtless the most careful theoretical investigation of the cantilever and kindred types which has as yet appeared, and as such has a special interest of its own; especially as it illustrates its conclusions by detailed investigations of the Forth Bridge and other prominent designs.

The comparison of the necessary weights of a cantilever and plain Whipple truss for spans of 500, 600 and 700 ft. is of some general interest. It assumes 12,000 lbs. per square inch maximum strain and the actual weight of 12 cubic inches of *theoretical* volume to be 5 lbs., or 50 per cent., in excess of the actual weight of 12 cubic inches (for ordinary spans, Mr. Bender takes 4.75 instead of 5.0 lbs., making the excess only 42 per cent.). The two types will then be to each other in weight as—

	700 ft.	600 ft.	500 ft
Cantilever bridge	627	406	207
Plain Whipple truss	641	414	258

In the Appendix appears a reprint of some articles from the *Railroad Gazette* and a summary of Mr. James Christie's recent experiments.

Foreign Technical Notes.

The German Society of Mechanical Engineers offers a premium of 1,000 marks ($243) for the best plan for a boiler shop in which 16 locomotive boilers can be constructed at once; also a premium of 300 marks ($73) for the best essay on the subject, "What Method of Tire Fastening on Railroad Rolling Stock is Best, according to Present Experience."

A very exhaustive series of statistics on the wear of rails on the railroads of the German Railroad Union, embracing the Dutch, German, Belgian and Austrian roads, shows rather irregular results as to wear of head, ranging from 1 *mm.* ($\frac{1}{25}$ in.) for 1.919 million tons carried up to 1 *mm.* for 22.111 million tons carried.

The first result was attained on grades of from 1.7 to 2.5 per cent., and on track with curves as short as 600 ft. radius (9 deg. 33 min. curve), and the latter with 0.5 per cent. grades and 2 deg. 30 min. curves On track with curves of 3 deg. and grades of 0.33 per cent. a wear of 1 mm. per 12.535 million tons was found, and with 0.5 per cent. grades and 6 deg. curves a wear of 1 mm. per 9.481 tons was found.

The result as to wear showed the curious feature that the wear per million tons carried, as a general rule, decreased as the head wore down. This applies not only to straight lines, but also to curves.

The German Railroad Union in March, 1883, offered a number of prizes for inventions and improvements in the departments of road construction, rolling-stock and general office work and statistics, and also for railroad books of distinguished merit, which should be introduced within the six years ending July 15, 1884. Prizes have now been awarded as follows:

A prize of 3,000 marks ($729) to Richard Schwarzkopf, an engineer of Berlin, for a "safety apparatus for steam boilers," and another of the same amount to Herr Heindl, of the General Inspection Department of the Austrian Railroads, for a system of iron cross ties; also to Herr Schrabetz, a civil engineer of Vienna, a prize of 1,500 marks ($364) for a rail-bending machine.

General Master Mechanic Mahla, of the General Direction of the Bavarian Transportation Department, receives a prize of 3,000 marks for a hose coupling for a steam car-heating apparatus; and Herr Sedlaczek, Telegraph Controller of the General Direction of the Austrian State Railroads, is awarded a prize of 1,500 marks for an electric head-light.

To Herr Ulbrecht, Office Manager and Chief of the Statistical Bureau of the Saxon State Railroads, is given a prize of 1,500 marks for a manual for abbreviating and simplifying the work of calculating traffic statistics; to Messrs. Brosius and Koch, a prize of the same amount for their "School of the Locomotive," a work similar to Forney's "Catechism of the Locomotive," and published a few months later; and a third of the same amount to Herr Frank, Professor in the Hanover Technical High School, for his "Treatise on the Resistance of Locomotives and Trains, Water and Coal Consumption, and the Work of Locomotives."

German statistics for 1884 show about the same number of axles broken in operation as in the previous year, and less breaks in winter than in summer.

The average life of the broken axles was as follows for the two last years:

	1884. Yrs.	Mos.	Dys.	1883. Yrs.	Mos.	Dys.
Under locomotives	14	11	14	14	8	...
" tenders	10	2	4	14	7	25
" cars	17	1	20	15	0	7

And the mileage (allowing 0.6 miles per kilometer):

	1884. Miles.	1883. Miles.
Under locomotives	235,113	208,013
" tenders	233 210	191,057
" cars	210,594	204,856

The average loads for the broken axles were as follows in pounds:

	Standard maximum.	Actual loads when broken.
Locomotives	25,696	25,676
Tenders	15,446	14,159
Cars	14,747	14,208

In only 10 cases were the axles overloaded when broken, and in these cases the average overload was 3.7 per cent. of the standard maximum.

Of the broken locomotive axles 32 were driving and 3 ordinary; of tender axle broken 96 per cent. were axles used with brakes, and of car-axles 33 per cent.

Of axles broken 67 per cent. were iron and 33 per cent. steel, against, respectively, 77 per cent. and 23 per cent. in 1883.

The oldest axles broken had been 32 years in use—antiquity which, even in statistical Germany, made its origin unknown.

As to the location of the breaks, they were as follows:

	1884. Per cent	1883. Per cent.
In the journal	57	49
Just inside the hub	16	16
In the hub	14	28
Toward mid axle	3	3
At mid-axle	4	1
Not stated	6	3
	100	100

The proportions of old and fresh breaks were:

	1884. Per cent.	1883. Per cent.
Fresh breaks	15	16
Slight old breaks	18	26
Serious " "	43	35
Rubbed surface in break	7	13
Not stated	17	10
	100	100

Of the old breaks 24 per cent. were of such character that careful inspection would probably have revealed them. The axles broken in operation were to those found broken by inspection and changes as 1 to 10½.

The last number of the *Organ for Railroad Progress* (German) translates our description of the Phelps induction telegraph, of the rotary steam snow shovel, and summarizes our reports on nut-locks and articles on "Breaking of Angle Plates," "Extraordinary Creeping of Rails," "The Heaviest Rail Section in America," and the engraving of the steel profile of road-bed and track of the Michigan Central Railroad.

Where good concrete gravel or stone is lacking, while furnace cinder is to be had, an admirable concrete can be made out of the latter which has found extensive use in southern France for all sorts of wall and vault construction. The usual proportions, for ordinary work, are 4 of cinder to 1 of lime. The latter would be either ordinary or hydraulic, as the case requires; and where great strength is required the proportion of lime is increased at pleasure. No mention is made of any mixture of sand or ground cinder, which are probably not needed for the purpose of concrete. The garbage-destructors in England grind their cinder, and after mixing with lime, sell it as mortar; which is especially in request, as the sharpness of the ground cinder makes it equal to, or better than, the sharpest natural sand.

In all constructions the ramming of the layers of this material should be done at right angles to the plane of the bed, so that in arches this ramming would be tangential to the arch soffit.

The lightness of this material is an advantageous feature in many cases, its weight being, as above composed, 76.9 lbs. per cubic ft. Such walls and arches have proved extremely fireproof in heats great enough to melt iron and vitrify the wall surfaces.

TECHNICAL.

The Car Shops.

The Westinghouse Air Brake Co. in Pittsburgh, recently shipped brakes for 200 freight cars to a railroad in Chili, S. A., and has another order to fill for the same country. The Westinghouse Co., it is said, will shortly increase its capital stock from $600,000 to $3,000,000.

The Boston & Albany car shops at Allston, Mass., are building 2 new drawing-room cars for the road. They are to be 57 ft. 6 in. long, and will be mounted on 42-in. Allen paper wheels. The interior finish will be in mahogany. These cars will have the Mann roof and the Mann system of ventilation, which is highly approved by the officers of the road.

The Bradley Car Shops in Worcester, Mass., have just completed 4 passenger cars and 1 combination baggage and passenger car for the Chicago & Eastern Illinois road. The inside finish of these cars is of ash and cherry, and the seats are of rattan.

The Cobourg Car Works in Cobourg, Ont., have completed 2 passenger cars for the Canadian Pacific road.

The Ontario Car Works in London, Ont., have received a contract for 2 second-class passenger, 5 caboose and 20 freight cars for the Intercolonial road.

Bridge Notes.

The Union Pacific Railway Co. has determined to increase the capacity of its bridge over the Missouri River at Omaha so as to accommodate all classes of business which may desire to use it. As it has been found impracticable to adapt the piers of the old bridge to a double-track structure, what is virtually a new bridge will be built on the same site. The new structure will be a double-track railroad bridge with two carriage and foot-ways and provision for a street railroad. It will be supported on granite piers, which will take the place of the present iron cylinder piers. Mr. George S. Morrison, of New York, is the Engineer of the new bridge. Work on the new structure, which will be much heavier than the old one, was begun last week, and it is to be completed in about three years, the entire work to be done without interrupting the traffic. The present bridge was completed about 1870.

The Keystone Bridge Co., in Pittsburgh, recently completed a large iron bridge at Farmington, Conn., for the New Haven & Northampton road. The same company has secured a contract for two other bridges for the same road, one at Holyoke, Mass., and the other at New Haven.

Iron and Steel.

No. 2 blast furnace of the Pennsylvania Steel Co. in Steelton, Pa., has completed its fourth year in continuous operation, and during that time it has made 165,323 tons of pig-iron.

An attempt was made on Sept. 21 to start up the mills of the Cleveland Rolling Mill Co. in Cleveland, O., but only about 40 men out of the large number employed in the works came in. On the following day, however, nearly one-half the men went to work.

The Helmbacher Forge & Rolling Mill Co. put some additional furnaces at work last week and reports an increased number of orders.

The McDonald Forge Works in St. Louis are doing very little at present, having only one hammer employed on car axles.

The Pennsylvania Tube Works in Pittsburgh are busy on some very heavy orders for 8-in. pipes, intended for conveying natural gas.

The Shenandoah Iron Co. at Milnes, Va., has failed, with liabilities of $700,000, including a mortgage of $500,000.

The Rail Market.

Steel Rails.—Quotations continue steady at $29@$30 per ton at mill for ordinary sections, with sales reported chiefly at $30. The mills are all pretty full of work at present and not at all disposed to shade prices.

Rail Fastenings.—Quotations continue nominally unchanged at 1.90 cents for spikes in Pittsburgh, 2.40@2.80 for track-bolts and 1.60@1.70 for splice-bars. An improved demand is reported and makers are hoping for better business.

Old Rails.—Not much better demand for old iron rails is reported just now and quotations vary from $16.50@$17.50 per ton at tidewater. The stock on hand is not large. Old steel rails are reported in increased demand and are quoted at $17@$18 per ton in Pittsburgh.

Engineers' Society of Western Pennsylvania.

The Society met in Pittsburgh, Sept. 16, for the first time since June 16. The subject of civil engineers on government work attracted the most attention. On this subject several communications were read. One letter, from Col. E. L. Corthell, of New York, stated that many influential civil engineers would be at Washington to argue for the establishment of the civil works of the Government on a civil basis.

A proposition from the Cleveland Club, naming Sept. 30 and Cleveland as the time and place for holding a national conference, was read and approved. The question of sending accredited delegates from the local society resulted in referring the matter to a committee of three with power to act, but not to incur any expense.

A communication was received from the Pittsburgh Chamber of Commerce, inviting President George H. Brown, of the Engineers' Society, to membership of the committee having in charge the Davis Island dam opening celebration, and also requesting the society as a body to take part. The meeting closed with the reading of a paper on Excavating, by Mr. S. B. Fisher, and the exhibition and explanation of a patent nut-lock.

The Severn Tunnel.

The first passenger train, containing Sir Daniel Gooch and Mr. Bassett, directors of the Great Western Railway Co.; Mr. Saunders, the secretary; Sir John Hawkshaw, the engineer; Mr. Walker, the contractor, and about 40 ladies and gentlemen, passed, on Sept. 4, through this remarkable tunnel under a large tidal estuary. The ordinary time to be occupied in passing through the tunnel is estimated at only 10 minutes. It will form part of an all-rail route between London and South Wales, which is 13 miles shorter than any now existing, and, as it supersedes a ferry, will effect nearly an hour's saving in time for passenger traffic between Bristol and the south of England and South Wales. It was primarily designed to afford a better and shorter route for the transport of Welsh steam coal to London, but it will also probably assist in making Milford Haven the future point of departure for the United States mails, the saving both in time and distance as compared with the present route, *via* Queenstown, being very considerable.

The tunnel is 26 ft. wide, 20 ft. high from the rails to the crown of the arch inside the brickwork, and has a double line of rails laid on longitudinal sleepers. More than a mile of it has been excavated through the hard Pennant sandstone and the coal measures, half a mile through conglomerate overlying the Pennant, half a mile in the shale of the coal measures, with some beds of coal nearly 12 in. thick, and the rest through the red marl of the new red sandstone. About 4½ miles of actual tunneling are beneath the bed of the river, but this distance is stated to be as perfectly dry as the floor of a room, the only sign of water from leakage from the once troublesome landsprings being on the Monmouthshire side, near what is known as the Five-mile Four Chain Shaft, where the great spring was tapped in 1883, when this part of the works was flooded. The leakage, however, was very slight, and it will be easily stopped by calking and cement work similar in character to the plan adopted beneath the river. The cover or depth of strata between the river bed and the crown of the tunnel has a minimum of 30 ft. At this point there is always 55 ft. of water over the tunnel, even at low tide, while at high tides this is increased to no less than 91 ft. Seventy-five millions of bricks have been used in lining the tunnel throughout with Staffordshire or vitrified bricks set in cement. This arched crown or wall has a thickness of 3 ft. in the deepest part of the work beneath "the Shoots," but as the tunnel rises from the lowest point this thickness is gradually reduced to 2 ft. 3 in.; 700,000 cubic yards of material have been excavated, chiefly through rock.

The work, from commencement to finish, has been spread over a period of 12 years, but the present contractor has been in possession of the work only 5½ years. The act of Parliament for construction was obtained in 1872, and the Great Western Railway Co. carried on the work itself to 1879, sinking five shafts and driving a considerable quantity of heading to prove the nature of the ground. But in 1879 the workmen tapped a land spring on the Monmouthshire side of

the river, and it filled the whole of the work in 24 hours. Negotiations were then opened with Mr. Walker, who undertook the work from that time, and he got the works clear of water by November, 1880. Progress was made till 1883 without special difficulty. The gradient of the level of the rails in the tunnel had been lowered in 1880 by 15 ft. to get more head cover under the river, and at the lower level in October, 1881, the old spring was again tapped, but in much larger volume, and the water poured in at the rate of 27,000 gallons per minute. Powerful pumps were obtained, and by a diver succeeding in closing a door in the heading the work was only suspended a fortnight, and this great spring has now been dammed back by masonry and massive brickwork. The gradient from the English side is 53 ft. per mile to the lowest point beneath "the Shoots" (the deepest part of the river), but the ascent from that point to the Welsh side is 59 ft. per mile. A powerful fan, 40 ft. in diameter, has to be erected to complete the ventilation, and some cuttings on the Gloucestershire side, together with the junction with the main lines and the doubling of portions of the line from the English end to Bristol, have to be finished before the tunnel will be opened for traffic, probably in two or three months.

A New Electric Train Signal.

E. M. Wallace, train dispatcher of the Southern Pacific, and J. S. Capers, of the Louisville & Nashville, have perfected a patent electric bell arrangement for trains, both freight and passenger, which is destined to supersede the bell-cord now in use. The invention is a simple and effective one, and is so arranged that the connection between the cars and the locomotive is automatic. The breaking loose of a car or cars of a train is signaled to the engineer by the breaking of the circuit or connection instantaneously.—*Atlanta Constitution.*

The Hopper System of Weighing Grain Transferred from Car to Car.

The Chicago *Tribune* gives the following account of the method of weighing and transferring grain in use on the Lake Shore & Michigan Southern Railway at Englewood, a junction just south of Chicago:

"The main tracks upon which the freight-cars are switched are elevated at a height of 30 ft., and are reached by a trestle approach about 1,000 ft. long. The frame building which incloses the platforms or floors is about 190 ft. long, and gives room for 10 freight cars at a time, five on each track. In the space between the tracks five hoppers are arranged capable of holding about a carload of 1,500 bushels. The contents of each car are unloaded directly into the hopper in about 6 minutes, the whole five being emptied at one and the same time. In the case of oats the time averages somewhat longer. As soon as the car is unloaded, an attachment to which a flag is arranged notifies the deputy weighing inspector on the floor below of the fact, and he takes the weight from the scales of which the hopper forms a part. This being concluded, a lever draws the slide from an opening in the centre of the hopper, and the grain passes through a large funnel which extends directly into the body of the Eastern freight cars that stand on the ground track below. The same process follows with the five cars on the other track as soon as the grain has passed from the hopper, and the empty cars are immediately drawn out and their places supplied by others. In order to secure the utmost accuracy the scales are built on stone foundations, and are thus rendered secure from settling, making it almost impossible for them to get out of line. In order to guard against any variations produced by climatic causes the scales are carefully adjusted by the inspector every morning. The mechanism is a very simple one, and presents certain features whose superior advantages must be apparent to the most inexperienced. The average number of cars unloaded an hour is about 15, which shows a decided gain in time over the old way of shoveling from one car to another. The arrangement of the apparatus is such that there is but little or no waste; and, last of all, being inclosed, the inclemency of the weather at any season cannot interfere with the operation.

"An important consideration of this new system is its cheapness, the charge for weighing being only 70 cents per car. This circumstance is likely to have a strong influence in its relation to the subject of terminal charges. The statistics taken from the report of the Railroad and Warehouse Commissioners for the crop year of 1884 show that more than one-half of the grain sold was by sample, the remainder being from the elevators. It is claimed that the proportion in favor of sample sales will be materially increased during the present year, inasmuch as the hopper-scale system gives as accurate a degree of weights as is obtained from the elevators, and the facilities for transacting a large volume of business are equal in other respects."

Locomotive Exports of the United States.

A correspondent of *Bradstreet's* says:

It is not generally known that the export of railway locomotives alone is now large and nearly $3,000,000 in value yearly, and also that these instruments of power, traffic and transportation are doing something to honor the American name in countries rarely visited by an American steam vessel. During the fiscal year ending June 30, 1884, 282 locomotive engines were exported from the United States to foreign countries, valued in the manifests at $2,819,946, or nearly $10,000 each. Of car wheels, the number sent was 14,335; value, $135,133; and of stationary engines, 135; value, $171,000. It would be safe to assume the railway motor material exported to be $3,000,000 in all, a very creditable aggregate, and just double the like export of 1881–82, when 133 locomotives were sent out, valued at $1,455,717. These locomotive exports for 1883–84 were to the following countries:

	Number.	Value.
Argentine Republic	65	$906,163
United States of Colombia (and Panama)	49	402,405
Mexico	34	341,865
Brazil	32	296,113
Dominion of Canada	27	208,339
Chili	19	232,569
Australia	14	107,000
Central America	13	113,600
Cuba	14	93,834
Spain	6	63,743
San Domingo	3	13,225
Sweden	3	25,000
Venezuela	2	9,870
England	1	6,616

This distribution is so wide and so well maintained for a series of years, that there must be a definite cause to be found, and it is probably due to the one cause of superior quality. In the previous three fiscal years the exports were 99 in 1881, 133 in 1882 and 219 in 1883, each ending June 30 of the year named.

It is shown by the export statistics of the last ten fiscal years that the locomotives sent from the United States to South America were 430 in number, valued at $4,541,165, 203 of these going to Brazil, 84 to Colombia, 72 to the Argentine Republic, 37 to Peru and 31 to Chili. Canada and British Columbia have taken 208, valued at $1,908,129; Mexico 167, value $1,808,699; Australia 115, valued at $1,079,170; Cuba 88, value $772,911; Russia 58, value $778,500; Central America 22, $108,022; Turkey 12, $182,000; Spain 9, England 8 and France 1, these last countries being less advanced in the science of transportation by rail than the countries using American engines presumably.

It is altogether a remarkable record. Having sought the explanation with some care, I am able to indicate some points of probable importance. First, the American locomotive is built with a different position for the driving shafts communicating the power to the axle, the American being external and the English internal, or between the wheels. The valve faces open internally in a narrow space, difficult of access, in the English engine. In the American they open externally, and are readily accessible for refacing and repairs of the worn cylinder, while to reach the English valve-faces the machinery must be taken apart almost entirely, involving much delay. And because of this costly delay the engines are run until they are much worn, and steam is wasted as well as other risks incurred.

The English claim greater steadiness for the running of these interior connections, but the axle is a difficult piece to make, and it often breaks. Severe accidents, with loss of life, have recently occurred from a broken axle of this sort. Attempts have been made in England toward the use of the American device, but they were not persisted in. But the free choice of Australia has taken 115 of our engines on test of their working efficiency, Brazil over 200, the states of the river Plate 75, and thirty other countries more or less each, all for the same reason, that they proved more efficient in actual work.

THE SCRAP HEAP.

An Elephantine Accident.

A dispatch from St. Thomas, Ont., Sept. 17, says: "Several versions of how the elephant 'Jumbo' was killed have been telegraphed from here. The following is the story in detail as told by those who witnessed the accident:

"The Barnum, Bailey & Hutchinson shows arrived here from Chatham Tuesday morning and unloaded near where their tents were pitched, a short distance east of Miller street. While the evening performance was in progress, the usual plan of loading the animals was proceeded with. There are 31 elephants in connection with the show, and of these all had been placed on board of the cars with the exception of Jumbo and Tom Thumb, the dwarf clown elephant, who created so much merriment during the performance. As these two latter were being walked along the track in order to reach their cars, special freight train No. 151, engine No. 88, driver William Burnap, approached from the east. The headlight of his locomotive was not observed until it was within 500 yards of the animals, when signals were given.

"At about the same time the engineer noticed the elephants on the track and whistled for brakes three times, and reversed his engine, but the track there being a down-grade, the train could not be stopped. Jumbo was ahead, in charge of his keeper, Mr. Scott, with Tom Thumb in the rear. When "Scotty" noticed the danger he urged Jumbo to increase his pace, and the animal started on a run down the track with his keeper running by his side, but it was no use, the train could not be stopped, and as it came thundering along it first struck the clown elephant, throwing him into the ditch, and then dashed into Jumbo. As it struck the mighty monster it was as if two trains had come together, and the freight train was stopped, the engine and two cars being derailed. Jumbo was struck in the hind leg, and as the cowcatcher hit him he emitted a loud roar and fell, the engine and edge of the first car passing along his back and inflicting terrible bruises. Jumbo was not instantly killed, but lived for 15 minutes after being struck, expiring while efforts were being made to take him from under the train.

"The engine was badly damaged and will have to be sent to the shops and rebuilt. A few minutes after the accident occurred men were set to work and the engine and cars were replaced on the rails and then the work commenced of pulling poor Jumbo from the track. Large cable ropes were attached to him, one to the front and another to the back part of his body, and about 100 men buckled on to each cable, while another force of men, with planks and crowbars, pried from behind. After about half an hour's labor Jumbo's body was pulled off the track into the ditch. The circus employés running hither and thither with flaming torches, the cool-headed master of transportation giving orders to 200 men pulling upon the cables and those prying behind, while to the one side stood Mr. Hutchinson and other managers of the show sorrowing for the loss of their favorite Jumbo, presented a scene not soon to be forgotten. While Jumbo was being pulled off the track the veterinary surgeons in connection with the show were attending to the elephant Tom Thumb. He had been thrown into the ditch and it was found that his left leg had been broken. It is expected that the leg can be saved, and after the limb was set he was lifted in a car to be taken away with the rest of the animals when the train left for London."

Courtesy to a Stranger.

"Gentlemen, would you mind moving along and giving me a seat? I don't feel very well."

"You look well enough to stand; we're crowded already," said a glum young man.

"Excuse me, but I've traveled all the way from Montreal and I didn't—"

Within two minutes the stranger had a choice of all the seats, and he wasn't from Montreal either.—*Philadelphia North American.*

A Somnambulist on a Train.

"Say, I had the worst case I ever struck coming down last night," said George Ferguson, the popular and well-known Western & Atlantic conductor, just before his train pulled out last night.

"What?" asked one of the party to whom he was talking.

"A somnambulist. A sleep walker."

"Oh, that's nothing. I've eaten in my sleep," said one.

"Yes, and I have dreamed in my sleep," said another.

"And I have written poetry in my sleep," said the third.

"And I have been rich in—" started the fourth.

"Yes, but none of you ever struck a man walking in his sleep on a train running 50 miles an hour," said Conductor Ferguson. "Now, let me tell you. We leave Chattanooga at a quarter to 11. Last night I had a big crowd. On the sleeper were a gentleman and three ladies. They were rich. Going from New York south. Well, I went through the cars. The gentleman gave up his tickets. He was an elderly, fine-looking man, but I soon forgot him. About midnight I was in the smoker, about four cars ahead of the sleeper, when the man came up to me, and laying his hand on my shoulder, said:

"'When does the south-bound train leave?'

"'Leave here?' I asked.

"'Chattanooga for Atlanta.'

"'Ten forty-five. It has left.'

"'Left! Why, I wanted to go on that train.'

"'Well, you are on it.'

"'No; I want to start to Atlanta on that train. What am I to do?'

"'You are on it,' I answered, beginning to think the man full.

"'On it? Well, come with me and let's see.'

"We walked back to the sleeper. The ladies had not retired, but were sitting up asleep. The man woke one of them and began to say something. The lady arose excitedly, and, grabbing him by the shoulder, shook him violently. Presently the man rubbed his eyes, and then asked what was wanted. The ladies explained that he was a somnambulist, and when he awoke, which he did in a hurry, he apologized."—*Atlanta (Ga.) Constitution.*

Baggage.

I had a woman come in to check a trunk one evening, a real respectable, good, big family trunk. It was pretty tolerable heavy and came down on the pile like a ton of rock. "My goodness alive," says she, "don't smash that trunk around so. You'll break everything in it. It's full of canned fruit." Says I, "It is, is it? Well you'll find the express office just one door south. The clerk who checks canned fruit has just gone over to his old home to take possession of the post-office and won't be back for a week." You ought to have seen her wilt down. Says she: "Oh, you know it ain't full by any means. There's just one little two-quart bottle of peaches and it's all packed in bedclothes, so I don't s'pose you could break it if it fell ten feet." "Bedclothes," says I. "Are you in the habit of calling bedclothes wearing apparel where you came from, madam?" She didn't understand my last remark exactly, but when she realized that that little slip of her tongue had cost her about $7 express charges I think she was the maddest woman I ever saw. She took it nearly as hard as a fellow who came in one evening to get a nice-looking trunk checked to some place in Nebraska. It weighed almost as heavy as lead, but the fellow was willing to pay the additional. In handling the thing, however, it got dumped off the truck in some manner and burst open, and covered the floor with about three bushels of the handsomest potatoes you ever saw. The man went out behind the depot to swear, and staid so long that he missed his train. —*Baggageman in Burlington (Ia.) Hawkeye.*

Vaccinating Trainmen.

A dispatch from Concord, N. H., Sept. 10, says: "In accordance with the suggestion of the State Board of Health, the employés of all the railroads in this state will be vaccinated at the expense of the corporation, under the supervision of the board. The vaccination of employés of the Concord Railroad and branches, of the Northern and White Mountains Division, the Boston & Lowell, and of the Concord & Claremont and Peterboro & Hillsboro Railroads, will be begun at the passenger station in this city on Monday next, and will be continued through Tuesday and Wednesday. On the following Monday, for the convenience of employés in the northern part of the state, vaccination will be performed at Woodsville; on Tuesday at Lancaster, and on Wednesday at Fabyans and White River Junction."

Whistling in the Cars.

The car is full of passengers. The men are diligently perusing the evening papers, while the women are quite as diligently rehearsing their shopping experiences.

Suddenly the idiot in the rear seat begins to whistle in that nerve-destroying, blood-curdling falsetto which he knows so well—or so ill—how to affect.

The gentleman in front of him turns from his newspaper to glare at the whistler; but the whistler, with his eyes fixed upon the outside landscape, does not notice the movement, and whistles away as inanely as ever, and is quite unconscious of all things around or about him, even of the landscape aforesaid which he seems to admire, but which, in fact, he sees not at all.

A second gentleman joins in the glaring process, a third and a fourth, until, in less than five minutes, every man in the car is glowering at the whistling idiot as if he could murder him then and there.

The women, too, bid good-by to shopping and look round to stare and to giggle at the whistling fiend.

But he is quite oblivious of the fact that he is the cynosure of every eye and the object of everybody's hatred and contempt. His mouth preserves its pucker intact, and the shrill tones are expelled from his lips with a regularity and remorselessness which could not be improved upon were he an automaton, the last and greatest improvement on the accursed hand-organ or the irrepressible machine band.

Save his own—and possibly the ladies', who think it is "real fun, isn't it?"—there is not an eye in that car but has murder in it. But each gentleman had lotted upon reading his newspaper, and all return to it after bestowing their glares, each and severally, upon the windy impertinence. Each pair of ears, however, is wide open to the mournful strains which go echoing through the car, and though one may read never so devotedly, it is impossible for him to receive any clearly defined idea of what he is reading. It is impossible not to listen to that plaintive, wailing obligato which issues from the back seat.

One gentleman sighs audibly, another is heard to use language which is generally conceded to be "neither brave, polite, nor wise," and a third gentleman folds up his paper in an ostentatious manner, rams it into his pocket as though it were a dagger and looks things unutterable. Nobody is now reading; all thoughts tend in one direction; the whistler holds demoniac possession of every mind; each soul is in terrible enthrallment.

Finally one gentleman asks aloud:

"Has anybody got a string?"

Instantly every face is wreathed in smiles, while here and there is heard the cachinnatory or the giggling sound of appreciation and approval. The question is a simple one, and the request implied in it is one which may be preferred without one's being thought exacting or grasping.

But the effect of it is magnetic. It is a sort of talisman, and instantly transmutes vexation and anger into joy and gladness. The clouds have been swept away from the troubled faces, and upon each is now seen the sunshine of mirth and jollity.

All become friendly and sociable. A minute ago the probabilities were that no two persons in all that carful would ever speak to each other, though they rode side by side over 50 miles. Now all, even the ladies, have become as members of one family, and everybody is in the best of humor.

And still the idiot in the rear seat whistles away, as unconscious of the social revolution he has created as he is careful never to deviate into anything approximating correctness in his musical selections.

He is oblivious.

Everybody is good-natured and exhilarated. Even the whistling idiot is a blessing, if one but penetrate his disguise. —*Boston Transcript.*

Attempt at Train Wrecking.

A dispatch from Saratoga, N. Y., Sept. 21, says: "A fiendish attempt was made to wreck the West Shore train, which left Buffalo at nine o'clock last night, bearing a number of Republican delegates to the convention. Between Akron and Alabama, about 27 miles from Buffalo, a tie was wedged across the track. The cow-catcher passed over it, and the engineer stopped the train just in time to prevent derailing. A long delay was caused while tackle was being rigged to remove the obstruction. The circumstance caused considerable excitement on the train. A number of Indians from the neighboring reservation were gathered about the train when it stopped. Hon. John M. Davy, of Rochester, says that the Indians are responsible for the outrage, and this is the third attempt they have made to wreck a train. A drunken Indian was killed by a train last October, and his

friends have been unable to get any damages from the company. The attempt to wreck a passenger train is by way of getting even. The place for the outrage was well chosen, being between two curves."

General Railroad News.

MEETINGS AND ANNOUNCEMENTS.

Meetings.

Meetings of the stockholders of railroad companies will be held as follows:

Chicago & Eastern Illinois, annual meeting, at the office in Chicago, Oct. 6, at noon. Transfer books close Sept. 25.

Evansville & Terre Haute, annual meeting, at the office in Evansville, Ind., Oct. 19.

Lake Erie & Western, annual meeting, in Bloomington, Ill., Oct. 14.

Louisville & Nashville, annual meeting, at the office in Louisville, Ky., Oct. 7, at noon.

Minneapolis & St. Louis, annual meeting, in Minneapolis, Minn., Oct. 6. Transfer books closed Sept. 5.

Ohio & Mississippi, annual meeting, at the office in Cincinnati, Oct. 8. Transfer books closed Sept. 12.

Western Union Telegraph Co., annual meeting, at the office in New York, Oct. 14.

Dividends.

Dividends on the capital stocks of railroad companies have been declared as follows:

Chicago, Rock Island & Pacific, 1¾ per cent., quarterly, payable Nov. 2, to stockholders of record on Sept. 29.

Dubuque & Sioux City (leased to Illinois Central), 2 per cent, semi-annual, payable Oct. 15, to stockholders of record on Sept. 30.

Worcester, Nashua & Rochester, 1½ per cent., payable Oct. 1, to stockholders of record on Sept. 21. The last dividend was paid Jan. 1, 1885.

Railroad and Technical Conventions.

Meetings and conventions of railroad associations and technical societies will be as follows:

The *New England Roadmasters Association* will hold its annual meeting at the Hotel Warwick in Springfield, Mass., beginning at 2 p. m., on Wednesday, Oct. 14.

Foreclosure Sales.

The sale of the *Rochester & Pittsburgh* road has been adjourned by the Court until Oct. 3. The postponement was made at the request of the trustee, on account of delay in entering the concurrent decree of foreclosure in Pennsylvania.

Trunk Line Presidents' Meeting.

At a meeting of the Trunk Line Presidents' Committee, at No. 346 Broadway, New York, Tuesday, Sept. 22, the members present were: Geo. B. Roberts, Pennsylvania Railroad Company; Joseph Hickson (General Manager), Grand Trunk; Chauncey M. Depew, New York Central & Hudson River; John King, New York, Lake Erie & Western; Robert Garrett, Baltimore & Ohio.

There were also present (not members) L. J. Seargeant, Traffic Manager Grand Trunk; H. J. Hayden, Second Vice-President New York Central; S. M. Felton, Jr., Vice-President, Erie; John S. Wilson, General Freight Agent, Pennsylvania; Samuel Spencer and Thomas M. King, Vice-Presidents, Baltimore & Ohio; J. N. McCullough, First Vice-President, Pennsylvania Co., Pittsburgh, Cincinnati & St. Louis and Chicago, St. Louis & Pittsburgh.

George B. Roberts, Chairman; N. Guilford, Assistant Commissioner, Secretary.

The following is the official report of the proceedings:

After a general discussion the following resolutions were unanimously adopted:

"I. *Resolved*, That the Trunk Line Executive Committee be requested to advance west-bound rates at the earliest practicable date (say to the basis of 60 cents per 100 lbs., New York to Chicago); and that the representatives of the various trunk lines will use their utmost endeavors to maintain the rates agreed upon.

"II. *Resolved*, That this meeting adjourn until Thursday of next week, at 11 a. m.; that the Presidents of the Lackawanna and the Lehigh Valley and the General Manager of the West Shore road be invited to be present; and that the question of a permanent plan for the establishment and maintenance of rates be referred to the Trunk Line Executive Committee, and that said Committee invite the representatives of the above-mentioned roads to unite with them, and that they notify the Chairman of the Presidents' Committee when their report is prepared, to the end that he may call a meeting for its consideration at the earliest practicable moment. The Trunk Line Executive Committee are authorized to secure such aid and assistance from experts and commissioners as they deem necessary.

"III. *Resolved*, That the western connections of the trunk lines are hereby requested to restore east-bound rates to the basis of the tariff of July 13, 1885, taking effect Monday, Sept. 28, and that the trunk lines pledge themselves to take all measures they can to aid in their enforcement.

"IV. *Resolved*, That the matter of passenger fares be referred to the Trunk Line Executive Committee, with instructions to report at the meeting of the Presidents' Committee, on next Thursday week, a plan for the restoration to full rates of all classes of passenger fares, and their proper maintenance.

"Adjourned until Thursday, Oct. 1."

Brotherhood of Locomotive Firemen.

The annual meeting of the Brotherhood of Locomotive Firemen began in Philadelphia, Sept. 21, when a public meeting was held in the Chestnut street Opera House. Col. A. Loudon Snowden, who was chosen to preside, delivered a brief address upon the benefits to be derived from the right use of such organizations, and commended the heroism displayed by the members of the Brotherhood amid the dangers of their calling.

The opening prayer was then made by the Rev. G. G. Rakestraw, after which the chairman introduced Gov. Robert E. Pattison, who said that in extending, in the name of Pennsylvania, a welcome within her borders, he felt sure that he was giving expression to the sentiment of the people of the commonwealth.

Mayor Smith was introduced and welcomed the delegates to the city.

A long address was delivered by Col. J. B. Maynard, of Indianapolis, who spoke generally upon economic and social questions.

Col. Alexander K. McClure commented upon the "volume of progress" represented by such a gathering of representatives of an occupation that only sprang into existence during the lifetime of men who are not yet old.

Grand Master F. W. Arnold, of Indiana, was the next speaker. He said: "It was our policy at the founding of this Brotherhood to elevate the character of the labor with which we have to do, and we have not deviated from that course one particle in the 12 years of our existence. The organization was formed at Port Jervis, N. Y., 12 years ago, and at the end of the first year there were 12 lodges, with a membership of 200. It has steadily grown, year by year, except in the years immediately following the great riots of 1877, until at the ending of the last fiscal year it had 285 lodges and 14,689 members.

"Upon the disability or death of each member it pays to him or his heirs $1,500, and since September, 1873, it has thus given to the families of deceased members $271,764, and to those disabled $44,000." Mr. Arnold then referred to the general spread of the organization, which is now represented in nearly all sections of the country, and thanked the citizens of the city and state for the hearty welcome given the Brotherhood.

John Wanamaker spoke briefly, as did also Senator B. F. Hughes.

The Grand Secretary and Treasurer of the Brotherhood, Eugene V. Debs, delivered the closing address.

The delegates were given a dinner at the Girard House. Col. Snowden presided, and there were speeches from Gov. Pattison, Mayor Smith and others.

Sept. 22, the convention met in secret session at Association Hall, where sessions were held each day this week.

ELECTIONS AND APPOINTMENTS.

Central Passenger Committee.—Mr. C. P. Atmore, General Passenger Agent of the Louisville & Nashville, has been chosen Chairman, and Mr. W. A. King has been chosen Secretary, and also Commissioner, in place of Mr. S. F. Pierson, resigned. The Commissioner's headquarters will be in Cincinnati. Mr. King was formerly connected with the Cleveland, Columbus, Cincinnati & Indianapolis, and the Cincinnati, Washington & Baltimore roads at Cincinnati.

East Tennessee, Virginia & Georgia.—The following circular from General Manager C. H. Hudson is dated Knoxville, Tenn, Sept. 16: "Mr. W. H. Thomas is this day appointed Superintendent of Motive Power, with headquarters at Knoxville, Tenn."

Mr. Thomas has been for some time past Master Mechanic of the Western Division of the Chesapeake & Ohio road.

East Tennessee & Western North Carolina.—The office of General Superintendent T. E. Matson has been removed to Cranberry, N. C., the eastern terminus of the road.

Florida Railway & Navigation Co.—Mr. H. R. Duval is now Vice-President and General Manager, with office in Jacksonville, Florida.

Fort Wayne, Cincinnati & Louisville.—Mr. W. B. Beamer having resigned as Master of Transportation, the duties of that office have been assumed by General Superintendent W. W. Worthington.

Georgia Midland.—Major W. S. Greene has been chosen Chief Engineer of this new road, with headquarters in Columbus, Ga.

Houston & Texas Central.—Mr. J. Waldo having resigned the position of Traffic Manager and Agent for the Receivers to take another position, all reports heretofore made to him will hereafter be made directly to Charles Dillingham, Joint Receiver.

Milwaukee, Lake Shore & Western.—Mr. H. F. Whitcomb, for 13 years past General Freight and Passenger Agent, is appointed General Manager in place of H. G. H. Reed, resigned. Mr. E. H. Rummel, for some time past Superintendent of Construction, succeeds Mr. Reed as Chief Engineer. Mr. F. W. Rhinelander, Jr., is appointed Assistant to the President.

Missouri Pacific.—Mr. Wm. Kerrigan has been appointed General Superintendent of all the lines operated and controlled by this company. This is a new office, the appointment being made on account of the retirement of Vice-President Hayes. Mr. Kerrigan has been for some time General Superintendent of the St. Louis, Iron Mountain & Southern road.

Missouri Pacific in Kansas.—The directors of this new company are: R. P. Bryant, Lincoln, Kan.; T. C. Woods, Stockton, Kan.; Volney Ball, C. E. Faulkner, A. McClaflin, Salina, Kan.; A. S. Everest, W. W. Fagan, Atchison, Kan.; H. M. Hoxie, D. S. H. Smith, St. Louis; Jay Gould, New York.

Northern Pacific.—At the annual meeting in New York, Sept. 17, the old board was re-elected as follows: Thomas F. Oakes, St. Paul, Minn.; Frederick Billings, Woodstock, Vt.; Benjamin P. Cheney, N. P. Hallowell, J. L. Stackpole, Boston; John C. Bullitt, Charles B. Wright, Philadelphia; August Belmont, John W. Ellis, John H. Hall, Robert Harris, Johnston Livingston, Roswell G. Rolston, New York. The board subsequently re-elected Robert Harris President.

Ohio Falls, French Lick & Terre Haute.—The office of this new company is in Jeffersonville, Ind.; the directors are J. C. Blanquit, C. L. Cranse, T. B. Currey, H. E. Foster, R. H. Ramsey, W. E. Riley, C. W. Stillwell and W. P. Ward.

Ohio & Mississippi.—Mr. John M. Douglas resigned his position as director Sept. 22, and Robert B. Minturn was chosen in his place.

Union Pacific.—Mr. O. M. Mink, Assistant Treasurer, on Oct. 1 will become Comptroller and Assistant Treasurer, the object of the promotion being to bring the accounting of the Omaha and Boston offices under one system and supervision. Mr. James G. Harris is promoted from Transfer Agent to Assistant Treasurer and Transfer Agent.

Wabash, St Louis & Pacific.—Mr. W. B. Beamer is appointed Master of Transportation, with office in Springfield, Ill. He was recently on the Fort Wayne, Cincinnati & Louisville road.

Worcester, Nashua & Rochester.—Mr. Charles T. Sinclair, of Boston, has been chosen President in place of C. S. Turner, resigned. Mr. E. B. Stoddard, of Worcester, Mass., has been chosen a director in Mr. Turner's place.

PERSONAL.

—Mr. John M. Douglas has resigned his position as a director of the Ohio & Mississippi Company.

—Mr. John R. Hastings has resigned his position as Trainmaster of the Louisville, New Orleans & Texas road.

—Mr. F. W. Smith has resigned his position as General Superintendent of the Atlantic & Pacific road, dating from Sept. 15.

—Mr. Lyman Wilder, who died at Hoosic Falls, N. Y., Sept. 22, aged 86 years, had been a director of the Troy & Boston Co. from its first organization.

—Mr. Mercer Slaughter, General Passenger Agent of the Richmond & Danville Railroad, has tendered his resignation, which, however, has not yet been accepted.

—Mr. Robert Garrett, President of the Baltimore & Ohio Co., has returned from England, having arrived in New York, on the steamship "Etruria," on Sept. 20.

—Mr. T. P. Doll, who died recently at Richmond, Ind., was for a number of years Superintendent of Bridges and Buildings on the Third Division of the Chicago, St. Louis & Pittsburgh road.

—Mr. C. S. Turner has resigned his position as President and a director of the Worcester, Nashua & Rochester Co. He was for a number of years Superintendent of the road, and was subsequently made General Manager and afterward President also. When the management was changed, about ten months ago, he was relieved of his duties as General Manager, but continued President until now.

—It is reported that Mr. James McCrea, now Manager of the Pittsburgh, Cincinnati & St. Louis road, will be Vice President of that company and of the Pennsylvania Co., in place of Mr. J. N. McCullough, who, it is said, wishes to retire from active service on account of his increasing age and ill health. Mr. McCrea was for a number of years Division Superintendent on the Pennsylvania Railroad, and was transferred to the service of the Pennsylvania Company several years ago, being given the management of the Pittsburgh, Cincinnati & St. Louis, and its leased lines.

—Col. Wm. Yolland, since 1854 one of the Railway Inspectors of the British Board of Trade, whose reports on accidents we have sometimes published, died on Sept. 4, aged 75. He was an officer of the Royal Engineers, and before his service as Railway Inspector, had served in Canada, in the topographical survey of the United Kingdom, and in charge of astronomical observations. He also served on a sort of civil service commission, to determine the method of appointing and training officers of scientific, branches of the service intended to open these places to competition, and to abolish patronage.

—Mr. Myron P. Bush, for many years a prominent merchant of Buffalo, died suddenly at his residence in that city, Sept. 22, aged 64 years. He wae born in Clarence, N. Y., and at an early age removed to Buffalo, where over 40 years ago he formed the leather house of Bush & Howard, which still continues. Mr. Bush took an interest in several railroad projects intended to increase the business of Buffalo, and was one of the incorporators of the Buffalo, New York & Philadelphia Co., and for a number of years a director of that company. Some years ago he purchased a large interest in the Hannibal & St. Joseph road, and was for several years a director and Vice-President of that company and took quite an active part in its management. Mr. Bush leaves a large fortune.

TRAFFIC AND EARNINGS.

Railroad Earnings.

Earnings of railroad lines for various periods are reported as follows:

	1885.	1884.	Inc. or Dec.	P.c.
Eight months to Aug. 31:				
Ala. Gt. South...	$667,053	$687,331	D. $20,278	2.9
Cin., N. O. & T. P.	1,668,790	1,672,777	D. 3,987	0.2
Cin., W. & Balt.	1,097,924	1,172,923	D. 74,999	6.0
Des M. & Ft. D..	226,395	214,1 2	I. 12,273	5.7
Ft. Worth & Den.	304,155	321,677	D. 17,522	5 4
Mexican National	1,041,225	1,070,874	D. 29,649	2.8
Mobile & Ohio...	1,160,776	1,249,315	D. 88,539	7.1
Nash., C. & St.L.	1.375,001	1,550,846	D. 175,845	11.3
Net earnings...	555,420	672,572	D. 117,152	17.4
N. O. & Nor'east.	398.261	246,219	I. 152,042	61.9
Pennsylvania.....	28,961,006	31,940,231	D. 2,979,225	9.3
Net earnings..	9,328,725	11,654,670	D. 2,325,945	19.9
St. L., A. & T. H.:				
Main Line.....	765,227	873,713	D. 108,486	12.3
Belleville Line.	461,825	481,143	D. 19,318	4.0
South Carolina...	667,824	701,314	D. 33,490	4.8
Vicks & Mer....	262.413	293,540	D. 31,127	10 6
Vick., Shre. & T.	210,809	99,741	I. 111,068	111.4
Seven months to July 31:				
Cl.. C , C. & I..	$1.860,735	$2,102.940	D. $242.205	11.5
Oreg. Short Line.	952,790	462,200	I. 490,590	106.1
Net earnings...	273,388	*12,256	I. 285.644	....
Month of July:				
Cl., C., C., & I..	$265,128	$309,078	D. $43,950	14.2
Oreg. Short Line.	186,265	106,739	I. 79,526	74.3
Net earnings...	80,145	5,046	I. 75,099	....
Month of August:				
Ala. Gt. South...	$77,351	$86,087	D. $8,736	10.2
Cin., N. O. & T. P.	238,184	236,450	I. 1,734	0.7
Cin., W. & Balt..	137,117	176,734	D. 39,617	22.4
Des M. & Ft. D...	27,784	34,452	D. 6,668	19.6
Ft. Worth & D...	43.692	37,212	I. 6,480	17.5
Mexican National	112,640	113,250	D. 610	0.5
Mobile & Ohio:	132,807	143,606	D. 10,799	7.5
Nash., C. & St. L.	182,115	218,190	D. 36,075	16 6
Net earnings...	75,220	102,599	D. 27,379	26 6
N. O. & Nor'east.	38,617	27,209	I. 9,408	34 8
Pennsylvania.....	3,956,306	4,617,894	D. 661,588	14 3
Net earnings..	1,649,014	2,151.509	D. 502,495	23.4
St. L., A. & T. H.:				
Main Line...:	117,787	120.405	D. 2,618	2 2
Belleville Line.	64,229	58,267	I. 5.962	10.3
So. Carolina.....	73,694	64.719	I. 8,975	13.8
Vicks. & Mer....	34,719	35,382	D. 663	1.8
Vick., Shre. & T.	32,297	26,235	I. 6,062	23.3
Second week in September:				
Bur., C. R. & No.	$63,439	$61,412	I. $2,027	3.3
Canadian Pac...	180,000	137,000	I. 43,000	31.4
Chi. & Alton.....	206,164	235,328	D. 20,165	12.4
Chi. & East. Ill...	38,886	37,198	I. 1,688	4.5
Chi., Mil. & St. P.	482,000	471,430	I. 10,572	2.2
Chi. & Nor'west.	485,900	514,900	D. 29,000	5.6
Ch St. P., M. & O.	122.600	110,206	I. 12,394	11.3
C., I., St. L. & C.	48.507	56,997	D. 8,490	15.0
Illinois Central..	236,988	223.845	I. 13,143	5.9
Iowa lines.....	35,991	40.114	D. 4.122	10.3
Long Island.....	80,073	85,358	D. 5.285	6.2
Louis. & Nash...	256,835	256,130	I. 705	0.3
Roch. & Pitts....	28,076	25,439	I. 2,637	10.4
St. L. & San F..	82,700	104,000	D. 21,300	20.5

* Deficit.

Weekly earnings are usually estimated in part, and are subject to correction by later statements. The same remark applies to early statements of monthly earnings.

Coal.

Coal tonnages reported for the week ending Sept. 12 are as follows:

	1885.	1884.	Inc or Dec.	P.c.
Anthracite.....	773,574	855,155	D. 81,581	9.5
Eastern bituminous.....	175,613	186,707	D. 11,094	5.9
Coke.....	57,362	56,432	I. 930	1.6

The anthracite market is reported as improving, with increased demand and a slight rise in prices at tide-water.

Pennsylvania Railroad coal tonnage for the week ending Sept. 12 was:

	Coal.	Coke.	Total.	1884.
Line of road....	144.911	57,362	202,273	182,721
From other lines.	97,009	804	97,813	72,767
Total.....	241.920	58.166	300.086	255,488
Year to Sept. 12.	7,579,956	1,789,950	9,369,915	9,225,768

Increase for the week, 44,598 tons, or 17.8 per cent.; increase for the year, 144,147 tons, or 1.6 per cent.

Shipments out of the pools on the Monongahela River above Pittsburgh for the eight months to Aug. 31 were 65,900,750 bushels of coal and 2,068,857 bushels of coke,

Shipments of coal from Pittsburgh down the Ohio River for the eight months were 54,744,000 bushels.

Cumberland coal shipments for the week ending Sept. 19 were 59,072 tons. Total to Sept. 19 this year, 1,957,660; last year, 2,018,902; decrease, 61,242 tons, or 3.0 per cent.

Cotton.

Cotton movement for the week ending Sept. 18 is reported as follows, in bales:

Interior markets:	1885.	1884.	Inc. or Dec.	P. c.
Receipts	48,466	39,695	I. 8,771	22.0
Shipments	38,876	35,805	I. 3,071	8.5
Stock, Sept. 18	34,974	24,317	I. 10,657	44.0
Seaports:				
Receipts	84,743	80,737	I. 4,006	4.9
Exports	20,812	18,844	I. 1 968	10.5
Stock, Sept. 18	188,654	157,899	I. 30,755	19.5

The total shipments from plantations from Sept. 1 to Sept. 18 are estimated at 94,333 bales, against 84,627 in 1884 and 113,009 in 1883.

Petroleum.

The production and shipments of the Pennsylvania and New York oil wells in August are given by *Stowell's Petroleum Reporter* as follows, in barrels of 42 gallons:

	1885	1884.	Inc. or Dec.	P. c
Production	1,705,961	2,099,165	D. 393,204	18.7
Shipments	2,049,099	2,000,371	I. 48,728	2.4
Stock, Aug. 31	35,343,771	39,084,561	D. 2,740,790	5.2
Producing wells	22,688	21,916	I. 772	3.5

The production is smaller than in any month since March, and was exceeded in every month of last year. Of the total the Alleghany District in New York furnished 13.2 per cent.; the Bradford District in Pennsylvania 41.1; the Warren District 11.9, and the Lower District 33.8 per cent.

The shipments exceeded the production, as for several months past. They were larger than in any month of this year except May.

Stock on hand was reduced during the month by 343,138 barrels, which is the excess of the shipments over the production for the month.

There were 283 new wells completed during the month, their average daily production being 10.6 barrels each. There were 39 dry holes developed. On Aug. 31 there were 308 new wells under the drill, and preparations in progress to drill 214 others.

Shipments of oil from the wells to various points are given as follows, in barrels, 33.9 per cent. of these shipments being by rail:

	Crude.	Refined.	Total.	P. c.
New York	562,271	83,493	645,764	31.5
Philadelphia	486,671	152,411	639,082	31.2
Baltimore	106,708	15,039	121,747	5.9
Boston	16,009	82,956	98,965	4.9
Cleveland	264,757	.....	264,757	12 9
Pittsburgh	52,893	.....	52,893	2.6
Local points	183,931	41,960	225,891	11.0
Refined at Creek refineries	375,859	.....	.....	...
Total	2,049,999	375,859	2,049,099	100.0

In this statement the refined shipments are of oil refined at the Creek refineries. This is reduced to its equivalent in crude oil, so that the total represents the amount of crude oil shipped to each point named, whether sent in crude or in refined form.

East-Bound Rates.

A meeting of the Central Traffic Association was held in New York, Sept. 22. A communication was received from the Trunk Line Presidents requesting an advance in east-bound rates, and the Association, in accordance with this request, resolved to put rates from Sept. 28 on the basis of 20 cents for fourth-class and grain from Chicago to New York.

West-Bound Rates.

At a meeting of the Trunk Line Presidents held in Commissioner Fink's office, Sept. 22, all the roads were represented except the Delaware, Lackawanna & Western. After a general discussion a resolution was unanimously passed instructing the Joint Executive Committee to fix west-bound freight rates from Oct. 5 on the basis of the following rates from New York to Chicago: first class, 60 cents per 100 lbs.; second, 50; third, 40; fourth, 25; fifth, 20. The old rates were 40, 30, 25, 18 and 15 respectively. It was also resolved to request the Central Traffic Association to take some steps to put an end to the cutting of rates in Chicago.

The Joint Executive Committee subsequently held a meeting and took the action recommended by the trunk lines in regard to west-bound rates. Nothing was done toward the formation of a new pool.

Joint Western Classification Committee.

A meeting of the joint Western Classification Committee was held in St. Paul, Minn., last week. Some minor changes in classification were made and other routine business transacted. A large part of the session was given up to hearing argument presented by delegates from the Chambers of Commerce of St. Louis and Chicago and a number of other parties on the subject of abolishing car-load rates. The St. Louis and Chicago people favored the abolition, but a number of other parties appeared in favor of their continuance. The conclusion reached by the committee on this subject was against the abolition.

Texas Traffic Association.

The Commissioner of the Texas Traffic Association has issued an order providing that, at all points in Texas where two or more roads intersect, there shall be but one ticket office, which is to be a joint office, maintained by lines in interest. This will reduce the number of agents employed and will otherwise cut down the expenses of the roads. The Commissioner also orders that no agents shall be allowed to receive commissions from foreign roads.

RAILROAD LAW.

Crossing Collision—Negligence.

A passenger train of the Central Iowa Railroad halted at the Mason City junction in such a position that the rear passenger car was left standing over a cross track of the Chicago, Milwaukee & St. Paul Railroad; and in moving certain freight cars out of the way of an engine, the employés of the latter road pushed the cars on the cross track, and some of them, being heavily loaded, broke loose and ran down the grade into the passenger car of the Central, threw it from the track, turned it over and fatally injured a passenger therein. His administrator brought suit, and the Supreme Court of Iowa has just decided that the Central Co. was guilty of negligence and liable for the injury.

Right to Fix Rates.

A dispatch from Chicago, Sept. 19, says: "About a year ago John B. Sheldon, a country shipper, began a suit in the United States Circuit Court against the Chicago, Burlington & Quincy Railroad Co. to recover damages for alleged charging of extortionate freight rates. He claimed that the rates were in excess of the maximum rates as fixed by the Railroad Commissioners. The company filed a plea setting out that it was organized by the consolidation of five or six other Illinois railroads, all of which, save one, had the right by their charters to fix the amount of charges for carrying freight and passengers. Demurrers were filed to the pleas and argued some months ago before Judge Gresham.

"The Court decided yesterday that the consolidated company took its character from the character of the constituent companies, and that one of these companies was subject to legislative control, and that the consolidation was voluntary on the part of several companies. The case stood, Judge Gresham held, just as if the defendant had been organized by the consolidation of but two companies, one independent of legislative control, and the other subject to such control; and that in all cases in which doubts arose as to the powers of corporations those doubts should be resolved in favor of the public. The case will be carried to the Supreme Court under Judge Gresham's decision. The company will be compelled meantime to conform to the rates fixed by the Railroad Commissioners."

OLD AND NEW ROADS.

Baltimore & Ohio.—Notice is given to holders of bonds of this company falling due Oct. 1 that until that date they will have the option of extending those bonds for 50 years from that date at 4 per cent. interest; all bonds not so extended before Oct. 1 will be paid in cash on maturity. Holders not desiring to extend their bonds are requested to deposit them with Hallgarten & Co. in New York, or with Robert Garrett & Sons in Baltimore, for payment.

From present appearances it will require a good deal of small litigation to clear the way for this company's new line into Philadelphia. The latest suit is one in relation to the crossing of the Philadelphia, Wilmington & Baltimore tracks, and other small suits will probably follow, which may cause considerable delay.

Reports come from Chicago that the company intends to build a new line from a point on its present Chicago Division through to New York on a line which is said to be shorter than any existing road. Another report has it that the company is engaged in negotiations to secure control of the Wabash road, its special object being to acquire that company's entrance into Chicago. Both these rumors meet with very little credit among well-informed parties.

Beech Creek, Clearfield & Southwestern.—At a meeting of stockholders in New York, Sept. 24, it was decided to send formal notice to all parties concerned that the minority stockholders will continue to oppose the transfer of the road to the Pennsylvania Railroad Co. by all means in their power.

Boston & Lowell.—Shortly after it leased the Northern and the Boston, Concord & Montreal roads, this company made a traffic contract with the Concord Railroad Co., which was to run for five years, either party, however, to have the right to terminate it on three months' notice. On Sept. 1 this company gave the required notice, and the contract will accordingly expire Dec. 1 next.

Officers of this company contradict reports to the effect that they have been negotiating for a lease of the Montpelier & Wells River road, and say that nothing has passed between the two companies beyond the ordinary exchange of traffic.

Canada Pacific.—It is now announced that this road will be formally opened for traffic from Ottawa through to British Columbia, on Oct. 5.

A dispatch from Montreal, Sept. 21, says: "The Canadian Pacific authorities have for some time entertained suspicions that they were being victimized by their civil engineers and contractors in the section north of Lake Superior. A month ago all payments to the contractors were stopped and a remeasurement of the sections was ordered. This has just been completed and shows that by blunders and frauds the company has paid to its contractors hundreds of thousands of dollars in excess of the amount of work done. One contractor has been paid more than $100,000 too much, and another $50,000, the full amount aggregating $500,000. Detectives have learned that engineers, who were receiving $100 a month, were wealthy landed proprietors, and were engaged in extensive building operations, some of them being worth from $30,000 to $40,000, which has been accumulated in a wonderfully short time."

Central, of New Jersey.—The Special Master, to whom was referred this company's petition to recover possession of its road, began to take testimony in the case on Sept. 23, in Philadelphia.

Central Vermont.—This company has adopted for its main line a 72-lb. steel rail as a standard. About three miles of these rails are now being laid from White River Junction, Vt., northward. The 60-lb. rails taken up will be used on the branches and sidings.

Chesapeake & Nashville.—Reports having been circulated that the managers of this projected line intended to sell out to the Louisville & Nashville Co., a meeting of subscribers was held in Nashville, Tenn., Sept. 22, at which it was resolved to make no payment on the subscription until all doubts in the matter were set at rest.

Chesapeake & Ohio.—A dispatch from Wheeling, W. Va., says: "The following order, issued by Governor Wilson, is expected to cause trouble between the federal and state authorities:

"'It is the opinion of the executive department of the state that, when taxes due from a railroad company, whether state, county, district or municipal, are under the law certified by the Auditor to the sheriff for collection, they must be collected in the manner directed by law; that these, as taxes due by others, are in no way subject to compromise by county court or other tribunals, either as to amount, time, or manner of payment. The collection of the taxes due the state by the Chesapeake & Ohio Railroad Co. has been enjoined by the United States District Court until Nov. 1. If any further attempt is made by that company to effect a compromise with county authorities they are directed to notify the executive department at once.'

"The Chesapeake & Ohio owes the state $193,000 back taxes. Judge Jackson, of the United States District Court, last week enjoined its collection until Nov. 1, and forbade the state authorities to interfere with the county officials."

Cincinnati, Hamilton & Dayton.—The Cincinnati *Enquirer* of Sept. 19 says: "It will be remembered that some time ago the Superior Court of this city enjoined Hugh J. Jewett from voting a proxy at the annual election for directors of the Cincinnati, Hamilton & Dayton Railroad, and also enjoined the Erie Railroad Co. from receiving the proxy. The Court declared that the agreement between the Erie road and Mr. Jewett and the trustees of the Cincinnati, Hamilton & Dayton was invalid, and therefore void. Yesterday Proctor & Gamble and others, stockholders of the Cincinnati, Hamilton & Dayton Co., filed suit to compel the trustees to transfer back to the company the 20,000 shares of stock which stood on the books in the name of Mr. Jewett for the benefit of the Erie Railroad. They say that these certificates of stock should be transferred back, since the agreement under which Jewett held them was declared void, and that they should be reissued for the benefit of the stockholders. A request was made of the trustees to make the transfer, and they having failed to do so, this suit is to compel them to grant the request."

Cleveland & Marietta.—This company is now laying 1,000 tons of steel rails, which will complete the steel track from Canal Dover, O., to Caldwell. The best of the iron taken up is to be used in repairing tracks at other points.

Concord.—The traffic contract between this company and the Boston & Lowell will terminate Dec. 1 next, the Lowell Co. having, on Sept. 1, given the three months' notice provided for in the terms of the contract.

Dallas & Northwestern.—This new company has made an agreement with the Missouri Pacific, by which it will secure the use of the old Dallas & Wichita road from Dallas, Tex., to Denton, the new company agreeing to complete or extend the line from Denton to Decatur in one year. It is understood also that the Missouri Pacific people take a considerable interest in the new road and will probably control it.

Denver & Rio Grande.—The Coppell or New York committee gives notice that it has now at its disposal over $11,000,000 of bonds. The time for the deposit of securities has been fixed at Oct. 17, after which date persons depositing securities will be required to pay a small assessment. The proceeds are to be used to pay expenses of the suit.

Detroit, Bay City & Alpena.—This company is making arrangements to extend its road from Au Sable, Mich., northward about 30 miles to Black River. At that place connection will be made with the Alger & Smith logging railroad, which will be made part of the line, and which will carry it within 25 miles of Alpena. A branch is also to be built to Mud Lake, for logging purposes.

Elmira, Cortland & Northern.—This company has bought and will complete the Elmira Connecting road, a short line running across the city of Elmira, N. Y. The line is used entirely for transferring freight.

Fremont, Elkhorn & Missouri Valley.—The grading on this company's extension from Chadron, Neb., northwest to Rapid City in the Black Hills is now completed as far as Buffalo Gap, 52 miles from Chadron. Tracklaying has been begun and at latest reports 5 miles had been laid. The contractors have decided to complete the grading of the 49 miles from Buffalo Gap to Rapid City this season, if possible, and have a large force at work.

Georgia Midland.—At a meeting of the directors of this projected line last week delegations from different places were present, bringing pledges of support and subscriptions to the stock. After hearing the different delegations the board voted to build the line from Columbus to Athens, Ga., instead of to Atlanta, the subscriptions on that line being the largest. This decision is favorable to the Richmond & Danville Co., which desired the adoption of the Athens route in its own interest.

Georgia Railroad Commission.—The bill amending the Georgia Railroad Commission law has passed the Senate, after a long discussion, and now goes to the lower house of the Legislature. The bill is of importance as depriving the Commission of the absolute power to fix rates, which it has hitherto held. It provides, in effect, that each railroad company in the state shall make and publish a schedule of rates. If no complaint is made this schedule will stand, but in case of any dissatisfaction, complaint may be made to the Railroad Commission, which, after a hearing, may decide whether the rates are just or not, and may name new ones. This decision, however, will not be final, as heretofore, the bill giving either party a right to appeal from the decision of the Commissioners to the Superior Court and thence to the Supreme Court, the decision of that court to be final. The bill provides, however, that, pending an appeal to the court, the rates fixed by the Commission shall stand and shall be the lawful rates until either affirmed or set aside by the court. The bill also throws, in all cases of dispute as to the fairness of rates, the burden of proof upon the railroad companies. The chief point, however, over which the great discussion has been, is that an appeal from the decision of the Commissioners is permitted at all.

GrandTrunk.—*Herapath's Railway Journal* (London) of Sept. 12 says:

"We notice an anonymous announcement to the effect that a change in the directorship is mooted. The proprietors, of course, are best qualified to judge whether it is prudent to change horses while crossing the stream. Our own opinion is that the results aimed at could be reached in a less drastic matter. What are the matters of complaint? Divided management and suppression of important information. We are free to confess that the double management—here at London and in Canada—is a weak point, but in a great measure it is one inherent in all foreign companies. Still, more power seems to be vested in Mr. Hickson's hands than seems desirable, and one of two things should be done—either the control of the London board should be strengthened, or some of the directors should attend *pro rata* in Canada. Perhaps a resident director would best meet this latter point. Anyway an end should be put to a system under which the manager out in Canada appears to exercise autocratic control. We believe Mr. Hickson to be an able, zealous official, but the daily management of such a vast system should not be thrust on the shoulders of any one man. Especially as regards the manipulation of the suspense account he is undoubtedly in fault. Not as regards the principle, for where there is a 'lean' and a 'fat' half-year there is nothing objectionable in holding over part of the disbursements proper to the former to be wiped off in the latter. But the proprietors at least have a right to know when such payments are held over, and how much, month by month, is held over. This has not been done, and violent market movements each half-year are the inevitable result. Whether gambling or not has been done, all that can be said is that such mysterious proceedings give scope for it."

Houston, East & West Texas.—Track on this road is now laid to a point 176 miles northeast from Houston, Tex., leaving only 16 miles more to complete it to the Sabine River at Logansport. The grading on this gap is about finished and tracklaying is in progress. As the work on the Louisiana end is well advanced, it is expected that the through connection between Houston and Shreveport will be completed next month.

Houston & Texas Central.—The United States Circuit Court has given leave to the Lackawanna Iron & Coal Co., of Scranton, Pa., to file an intervening claim amounting to about $445,000. The claim is for 20,000 tons of steel rails, furnished under three separate contracts made in 1882 and 1883, and payment was made in notes bearing 6 per cent. interest. The Lackawanna Co. asks that the Receiver may be directed to pay this claim.

Intercolonial.—This company has completed a new passenger station in St. John, N. B. The new station has a main building of brick 84 by 116 ft. and two stories high, the first floor containing waiting rooms, restaurant and ticket office, and the second story being fitted up as a

residence for the station-master. In the rear of the main building is the train house, 502 ft. long and 84 ft. in width, and on the end adjoining the main building are two additions 115 ft. long and 15 ft. wide, intended to be used as baggage rooms. The station, which is very handsomely finished, was built under the supervision of Mr. J. T. McKean, of St. John, and was designed by the Chief Architect of the Public Works Department at Ottawa.

Kentucky Union.—The owners of this road have, it is stated, sold it to a syndicate of Virginia and New York parties. The sale includes several large tracts of timber and coal land, and the price paid is said to be $800,000, which includes the assumption of the debts of the company, about $100,000. Outside of the lands the property consists of the franchise, right of way and some graded road-bed. The purchasers propose to build the line from Lexington, Ky., to Abingdon, Va., to connect with the Norfolk & Western.

Lake Erie & Western.—A meeting of the first-mortgage bondholders was held in New York, Sept. 4. A number of the bondholders were present and appointed Lucius C. Ashley, T. C. Platt, F. C. Hollins, H. U. Smith, Elijah Smith, John C. Calhoun and W. A. Read a Committee on Reorganization. After consultation the Committee will offer a plan of reorganization which, it is hoped, will conciliate all parties interested.

Los Angeles & San Gabriel Valley.—This company has begun to run a train on the 10 miles of completed road between Los Angeles and Pasadena. Tracklaying is in progress from Pasadena eastward and the rails are reported down for 4 miles. The company expects to complete 25 miles this season.

Michigan & Ohio.—The Receiver of this road makes the following statement for the period from Nov. 6, 1884, to June 30, 1885 :

Earnings	$104,402
Expenses (105 9 per cent.)	110,527
Deficit	$6,125
Rentals	11,227
Total deficit	$17,352

The Receiver has operated 156 miles of road. He had issued, up to June 30, certificates to the amount of $208,500 in all.

Missouri Pacific in Kansas.—This company has filed articles of incorporation in Kansas, the incorporators being nearly all officers of the Missouri Pacific Co. The new company has purchased the franchise and work done on the Topeka, Salina & Western road, which has about 17 miles of track finished and some 20 more graded. A large force is to be put at work on the completion of the line, which is to extend from the east line of Saline County to the east line of Graham County.

Montpelier & Wells River.—Mr. D. R. Sortwell, President and chief owner of this road, contradicts a report that he has been negotiating for a sale of the road to the Boston & Lowell Co., saying that he has no intention of parting with the property. He also contradicts a report that he was about to build a branch from East Montpelier, Vt., to Barre.

Nashville, Chattanooga & St. Louis.—This company's statement for August and the two months of its fiscal year from July 1 to Aug. 31 is as follows :

	August.—		—Two months.—	
	1885	1884.	1885.	1884.
Earnings	$182,115	$218,190	$347,782	$405.664
Expenses	106,895	115,591	204,441	224,193
Net earnings	$75,220	$102,599	$143.341	$181,471
Interest and taxes			112.172	114,323
Surplus			$31,169	$67,148

This shows for the two months a decrease in gross earnings of $57,882, or 14.3 per cent , a decrease in net earnings of $38,130, or 21.1 per cent.; and a decrease of $35,979, or 53.7 per cent., in the surplus over fixed charges.

New York, Chicago & St. Louis.—A dispatch from Cleveland, O., Sept. 21, says: "A judgment for nearly $3,000,000 was rendered by Judge Heisley in the Common Pleas Court to-day against the New York, Chicago & St. Louis Co. The claim against the railroad was presented in the shape of three *cognovit* notes, the largest of which was for $2,000,000. It was executed Dec. 1, 1884, to W. H. Vanderbilt, President of the road. The next largest note, for $373,000, was made payable to the Lake Shore & Michigan Southern Co. The third note was for $250,000, and was drawn in favor of H. B. Hollins, bearing date March 24, 1885."

The report for the year ending June 30, as filed with the Ohio Railroad Commissioner, shows :

	1884-85.	1883-84.	Inc. or Dec.	P. c.
Gross earnings	$1,346,676	$1,447,713	D. $101,037	7.0
Expenses	1,098,559	1,213,901	D. 115,342	9.5
Net	$248.117	$233,812	I. $14,305	6.1
Rentals	170,752	170.838	D. 136	0.1
Balance	$77,365	$62.024	I. $14,441	22.9

This statement does not take any account of accruing interest, and gives only rentals actually paid.

New York & New England.—The Boston *Advertiser* of Sept, 21 says: "On Saturday, the period allowed by circular for exchanging the certificates of the New England Car Trust for second-mortgage bonds of the New York & New England Railroad expired. The account now stands as follows.

	Total issue.	Exchanged.	Outstanding.
Series A	$886.000	$857,000	$29.000
Series B	335,000	159,000	196,000
Total	$1 241,000	$1,016,000	$225,000

"To-day there will be a hearing before Judge Shipman at Hartford, on an application to exempt series B of the equipment from the sale which has been ordered to take place Thursday, Friday and Saturday of this week."

The arguments on the application to withdraw from sale the rolling stock included in Schedule B of the car trust were heard in Hartford, Sept. 22. At the close of the hearing the Court ordered that the sale of Schedule B be postponed until Oct. 22. The sale of the rolling stock in Schedule A of the trust was to be held Sept. 24 and 25, as heretofore ordered.

New York & Sea Beach.—This company, which owns one of the short lines running to Coney Island from New York Bay, is in embarrassed circumstances, and the employés have not received their pay for the season which is just closing. The road is only operated in the summer. The company also defaulted on the interest due Sept. 1 on the bonds.

New York, West Shore & Buffalo.—In the foreclosure suit before the New York Supreme Court in Newburg, Sept. 19, motions were made on behalf of the National Tube Works Co. and other claimants for orders directing the Receivers to pay certain claims for supplies furnished prior to March 1, 1884, provision having already been made for payment for supplies furnished after that date. On motion of counsel for the Receivers an order was made requiring notice to be given to all claimants of this class to appear before the court.

There was considerable discussion among counsel as to the provisions of the proposed decree, and the Court was asked to provide that the road shall not be sold for less than $28,000,000, ground being taken that this was a fair valuation according to the present price of the bonds. It was also claimed that the Court should make some provision for the protection of creditors and bondholders who have not joined in the agreement.

The petition of the New York & Albany Railroad Company, to be made a party to the suit on account of its claim to own a part of the right of way, was denied. The final decree was presented, but the Court decided to adjourn the case until Sept. 26, in order to permit all the claims to be presented.

Notice is given to all persons who have furnished labor, service or supplies to the company since March 1, 1884, that a hearing upon such claims will be held at the Court-house in Newburg, N. Y., on Oct. 3 next.

Northern Pacific.—At the annual meeting in New York, Sept. 17, the old management was re-elected without serious contest. Contrary to previous announcement no attempt was made to enjoin the voting of the stock held by the Oregon & Transcontinental Co.

A resolution was unanimously adopted requesting the board of directors to incur no floating debt for the construction of any new road or branches, and providing that only such road shall be built as can be constructed from the available resources of the company.

A "prominent director" is quoted as saying that the resolution adopted by the stockholders will not interfere with the completion of the Cascade Division, as the means for building that line have already been provided, and there will be no necessity for incurring any floating debt on its account.

North Shore.—A dispatch from Montreal, Sept. 22, says: "The negotiations for the transfer of the North Shore Railway from the Grand Trunk to the Canadian Pacific have been completed. There were present at the meeting Sunday night, which lasted until 1 o'clock yesterday morning, all the directors of the Canadian Pacific, with the exception of Mr. Stephen, who is in England. Messrs. Stephenson and Wainwright represented the North Shore Railway, and the Hon. J. H. Pope, Acting Minister of Railways, represented the Government. The charges upon the property taken over comprise the debt due the government, $3,500,000; the bonds outstanding, $1,750,000, and $500,000 for common stock and investments in the road by the late proprietors. No arrangement has been made with the Grand Trunk for interchange of traffic."

Old Colony.—This company last week completed 5 miles of the second track on its Northern Division, between Mansfield, Mass., and Walpole. Work on the second track is being pushed with the intention of completing it to Fitchburg by the close of the year. Extensive improvements are also to be made in Fitchburg, including a stone arch bridge over the Nashua River, a new passenger station and engine house, and a new repair shop.

Oregon Improvement Co.—Gross and net earnings in July and for eight months from Dec. 1 were as follows :

	—July.—		—Eight months.—	
	1885	1884.	1884-85.	1883-84.
Gross earnings	$226 975	$283,611	$1,818,394	$2,216,158
Operating expenses	180.533	218,591	1,471,070	1,716,329
Net earnings	$46,442	$65,020	$347,324	$499,829

For the eight months the gross earnings decreased $397,764, or 18 per cent., and the expenses $245,259, or 14.3 per cent., leaving a decrease of $152,505, or 30 5 per cent,, in net earnings.

Pennsylvania.—Tracklaying was recently begun on the extension of this company's Schuylkill Valley line from Reading, Pa., towards Pottsville, and the rails have been laid for 7 miles. A large part of the grading is finished, and the work will probably proceed with very little delay. Tracklaying will also be begun shortly between Pottsville and New Boston.

The company's statement for August shows for all lines east of Pittsburgh and Erie, as compared with August, 1884, a decrease in gross earnings of $661,588 ; a decrease in expenses of $159,093, and a decrease in net earnings of $502,495. For the eight months to Aug. 31, as compared with the corresponding period last year, the same lines show a decrease in gross earnings of $2,979,225; a decrease in expenses of $653,280, and a decrease in net earnings of $2,325,945.

Carrying out these changes, we have the following statement :

	—August—		—Eight months.—	
	1885.	1884.	1885.	1884.
Earnings	$3 956.306	$4.617,894	$28,961,006	$31,940,231
Expenses	2,307,292	2,466,385	19,6 2,281	20,285,561
Net earnings.	$1,649,014	$2,151,509	$9,328,725	$11,654,670
Per ct. of exps.	58.3	53.4	67.8	63.4

For the eight months to the end of August this year all lines west of Pittsburgh show a deficiency in meeting all requirements of $1,187,314, being an increase in deficiency of $474,823, as compared with last year. This shows for all the lines a net decrease of $2,800,768 this year.

Philadelphia & Reading.—A Philadelphia dispatch says that the managers of this company have instructed the President to confer with the President of the Pennsylvania Railroad Co., with a view of adopting a policy of harmony between the two companies. There have not been wanting lately indications that such a policy might be adopted.

In Harrisburg, Pa., Sept. 23, the Philadelphia & Reading companies filed a bill in equity against the South Pennsylvania Co. to restrain it from transferring its leases and contracts with the syndicate, and praying that the defendant be compelled to fulfill its part of the contract entered into and complete the road. Accompanying the petition is the agreement made with the Philadelphia & Reading companies, for the construction of the South Pennsylvania Railroad and its connection with the Philadelphia & Reading. The complaint of the Attorney-General previously filed, was for the violation of the constitutional provisions. The present bill complains of violation of the contracts entered into by the South Pennsylvania Co. with the plaintiff. There are over thirty counts in the present papers.

San Antonio & Aransas Pass.—This company has executed and filed for record a mortgage to secure an issue of $1,700,000 in bonds, to be used for the construction of the road.

South Pennsylvania.—A Philadelphia dispatch of Sept. 22 says: "It is stated here to-day that the action of the state authorities to have the sale of the South Pennsylvania Railroad to the Pennsylvania Railroad Company restrained will be settled one way or the other early in October. The case has assumed a new phase, and those who were most violent as stockholders of the South Pennsylvania in opposition to the sale, are now most anxious that the courts shall not grant a continuance of the injunction. Mr. Vanderbilt has stated that the enterprise shall be abandoned as far as he is concerned. Mr. Carnegie has expressed himself in the same way, and this being the case, there is a certainty that, even though the courts should forbid the sale, the line will never be completed, and those who have invested their money there will lose every cent of it. It is these stockholders who instigated the state to bring the suit that are now uneasy for fear that the same suit will be successful."

Versailles & Midway.—Track is reported laid on this road, which is a short local line extending from Versailles, Ky., northeast to Midway, on the Kentucky Central road. The road is 10 miles long, and has been built chiefly with county subscription.

Wabash, St. Louis & Pacific.—In the United States, in St. Louis, Sept. 22, leave was granted to Wager Swayne, trustee, to foreclose the mortgage on the Indianapolis Division of this line. The Court directed the Wabash Receivers to surrender the property covered by the mortgages to the trustee, or to a receiver to be appointed at his instance.

The Receivers have filed in the United States Circuit Court a report of receipts and expenditures from June 1 to Aug. 31. The totals are as follows : Balance, over-draft May 31, $126,769; receipts, June 1 to Aug. 31, $4,569,043; total, $4,442,274; total disbursements, $4,416,044; balance of cash on hand Aug. 31, $26,230. The receivers' certificates, issued under order of Court and applied in payment of sundry vouchers, amounted to $235,000.

Western Counties.—It is understood that negotiations have been resumed for the completion of this road to Annapolis, N. B., but nothing definite has yet been decided.

Wisconsin Central.—The work on the extension of this road to Chicago has been actively begun by Harrison & Green, the contractors, who have already a large force employed. The right of way has been secured from Schleisingerville, Wis., to the Chicago city limits. The entrance into the city, however, has not yet been decided upon, or, if a decision has been reached, has not yet been made public.

Wisconsin, Iowa & Nebraska.—At a meeting of the directors Sept. 16, at Marshalltown, Ia., this (commonly called the "Diagonal") road was transferred by the Iowa Improvement Co. to the Wisconsin, Iowa & Nebraska Railway Co., the transfer to date from July 1, 1885. The present officers will be retained.

Wolf & Wisconsin Rivers.—It is understood that construction is to be begun at once on the section of 15 miles of this road from Post Lake, Wis., into the pine timber. The company, which was recently organized, is controlled by Oshkosh lumbermen, who own extensive tracts of timberland on the proposed line.

Worcester, Nashua & Rochester.—The new management, which took charge of this road some ten months ago, reports that there has been a slight increase in earnings and a considerable reduction in expenses. After paying all charges, the earnings for nine months are sufficient to pay for four new locomotives, to pay a dividend of 1½ per cent., and to leave a surplus of about $20,000.

ANNUAL REPORTS.

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Fort Worth & Denver City	37	St. L., Iron Mountain & So	528
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Kan. City, Spring & Memphis	512	Union Pacific	199
Kentucky Central	214	Utah Central	325
Lake Shore & Mich. So	294, 310	Utica & Black River	128
Lawrence	213, 576	Vicksburg & Meridian	291
Lehigh Coal & Navigation Co.	128	Virginia Midland	27
Lehigh Valley	52, 464	Western North Carolina	247
Little Miami	448	Wilmington & Northern	479
Little Rock & Fort Smith	544	Wisconsin Central	432
Long Island	21	Worcester, Nashua & Roch	7
Louisiana & Mo. River	527	York & Peachbottom	310

Green Bay, Winona & St. Paul.

This company owns a line from Green Bay, Wis., to La Crosse, with a branch to Marshland, 220 miles in all. The following statement is made to the Wisconsin Railroad Commissioner for the year ending June 30.

The earnings and expenses for the year were :

	1884-85.	1883-84.	Inc. or Dec.	P. c.
Earnings	$303,190	$401,118	D. $97,928	24.4
Expenses	270,147	296,228	D. 26,081	8.8
Net earnings.	$33,043	$104,890	D. 71,847	68.5
Gross ear. p. m.	1,378	1,823	D. 455	24.4
Net " "	150	477	D. 327	68.5
P. c. of exps...	89.1	73.9	I. 15.2	....

Interest and taxes amounted to $102,586, leaving a deficit of $39,543 for the year; against $17,725, for 1883-84. The road is now in the hands of the Trustee under the mortgages.

Northern Pacific.

At the close of its fiscal year, June 30, 1885, this company had in operation the main line from Duluth, Minn., to Wallula Junction, Wash. Ter., 1,674.78 miles; the extension from Duluth to Ashland, Wis., 94.70 miles; the line from Tacoma, Wash., to Portland, Or., 143.20; the Puyallup and Carbonado branches, 17.40, and two sections of the Cascade Branch, 116.90, making 2,046.98 miles owned.

It also leases the St. Paul & Northern Pacific, from Brainerd, Minn., to St. Paul and Minneapolis, 143.34 miles.

The company also operated eight branches in Dakota and Montana, 477.65 miles in all, on which it guarantees the bonds, and of which it will ultimately become owner. The total road operated was thus 2,677.97 miles.

Additions during the year are noted below. The average mileage worked was 2,495.7 miles, against 2,332.9 in the previous year.

Since the close of the year the Jamestown & Northern Branch has been extended from New Rockford, Dak., to Minnewaukan, 25.3 miles, making the total road now worked 2,693.27 miles.

The equipment includes 391 locomotives; 114 passenger, 2 chair, 13 dining, 35 emigrant sleeping, 3 combination and 84 baggage, mail and express cars; 4,808 box, 75 refrigerator and fruit, 789 stock, 2,631 flat, 693 coal and 171 caboose cars; 14 business and officers' cars; 74 boarding, 33 road and service cars and 1 snow-plow; 891 hand and push and 47 velocipede cars. The company also owns one-half interest in 23 sleeping cars in use on the road.

The floating equipment includes two ferry transfer steamboats and two other steamers.

The general account is as follows, somewhat condensed :

Liabilities:

Common stock	$49,000,000
Preferred stock	38,610,584
Funded debt	67,733,500
Dividend certificates	4,640,821
Accrued interest	1,857,703
Bills and accounts payable	2,890,533
Sinking funds	54,307
Suspense account	52 108
Earnings invested in equipment	2,205,239
Profit and loss	91,960
Total liabilities	$167,136,755

Assets:

Road, equipment and lands	$155,080,387
Sundry st cks and bonds	2,090,894
Sinking funds and cash for retiring bonds	433,345
Accounts receivable	2,391,571
Supplies on hand	1,413,056
Dividend payments on land sales	3,230,791
Cash	2,496 711
Total assets	$167,136,755

The original amount of preferred stock was $51,000,000, of which land sales have canceled $12,389,416. The funded debt outstanding includes $2,233,500 Missouri Division; $3,240,000 Pend d'Oreille Division; $43,403,000 general first-mortgage and $18,857,000 general second-mortgage bonds. The interest charged is $4,064,010 yearly. The increase in the funded debt was $6,098,100.

In addition to the above the company guarantees interest on $9,553,000 branch line bonds, $5,438,000 St. Paul & Northern Pacific bonds and on two-fifths of $2,808,000 Northern Pacific Terminal Co. bonds.

Accrued interest, accounts payable and other floating liabilities amounted to $4,748,337; the floating assets and bonds unsold were $7,444,338.

The earnings for the year were as follows :

	1884-85.	1883-84.	Inc. or Dec.	P. c.
Freight	$7,446,266	$7,865,367	D. $419,101	5.3
Passengers	3,075,882	4,237,260	D. 1,161,378	27.4
Mail and express	657,515	433,436	I. 224,079	51.8
Miscellaneous	54,487	67,513	D. 13,026	19.3
Total	$11,234,150	$12,603,576	D. $1,369,426	10.9
Expenses	6,196,301	7,177,755	D. 981,454	13.7
Net earnings	$5,037,849	$5,425,821	D. $387,972	7.2
Gross earn. p. mile.	4,501	5,402	D. 901	16.7
Net " "	2,019	2,326	D. 307	13.2
Per cent. of exps.	55.2	57.0	D. 1.8	....

Expenses include taxes, which were $242,500 last year. Gross earnings on construction and company's materials (included above) were $258,700 last year, against $749,306 in 1883-84.

The result of the year was as follows :

Net earnings, as above		$5,037,849
Interest and sundry rece,pts		193,222
Total		$5,231,071
Interest	$4,123,949	
Sinking funds	50,376	
Rentals	581,144	
Guarantee on branch lines	352,154	
Terminal property at Portland	27,341	
Opening celebration bills paid	4,147	
		5,139,111
Balance, surplus for the year		$91,960

The total expenditures for new construction and equipment last year were $3,562,030.

The total resources of the year and the disposition made of them were as follows :

Surplus for the year, as above		$91,960
Land Department		1,245,557
Increase in liabilities		6,555,118
Decrease in floating assets		800,728
Total		$8,693,363
Construction and equipment	$2,993,637	
Increase in investments	540,416	
Land accounts	221,669	
Decrease in preferred stock	1,196,484	
" " liabilities	2,352,188	
Discount on bonds	845,181	
Increase in sinking funds	39,784	
" " cash on hand	504,044	
		8,693,363

The earnings of the leased St. Paul & Northern Pacific road were $1,163,323; the rental was 40 per cent. of this amount, or $465,329.

The branch lines on which interest is guaranteed earned last year $592,327; the expenses were $435,255, and the net earnings $157,072. The interest and sinking-fund charges were $352,154, showing a deficit of $195,082.

The Oregon & California Co. having failed to pay its proportion (one-fifth) of the rental due the Northern Pacific Terminal Co., this company was obliged to advance one-half the deficit. The total payments to the Terminal Co. were $84,280 for rent and $27,341 for cost of maintenance.

TRAFFIC.

The traffic for the year was as follows:

	1884-85.	1883-84.	Inc. or Dec.	P. c.
Pass.-train miles.	2,054,722	1,925,528	I. 129,194	6.7
Freight " "	2,838,017	3,179,470	D. 341,453	10.7
Passengers carried :				
Eastward	303,627	341,702	D. 38,075	11.1
Westward	306,061	374,338	D. 68,277	18.2
Total	609,688	716,040	D 106,352	14.9
Passenger miles :				
Eastward	37,556,505	47,006,973	D. 9,450,468	20.1
Westward	47,305,096	68,846,327	D. 21,541,231	31.3
Total	84,861,601	115,853,300	D. 30,991,699	26.7
Tons freight carried :				
Eastward	551,671	494,360	I. 57,311	11 6
Westward	705,209	948,440	D. 243,231	25.6
Total	1,256,880	1,442,800	D. 185,920	12.9
Ton-miles :				
Eastward	187,271,397	123,661,199	I. 63,610,198	51.4
Westward	203,796,800	276,467,862	D. 72,671,062	26 3
Total	391,068,197	400,129,061	D. 9,860,384	2.3

The average train load last year was 41 passengers or 138 tons of freight, against 60 passengers or 126 tons of freight in the preceding year.

The earnings per train mile and per unit of traffic were, in cents:

	1884-85.	1883-84.	Inc. or Dec.	P.c.
Earn. per pass.-train mile	181.70	242.50	D. 60.80	25.1
Net " " " "	71.30	108.50	D. 37.20	34.3
Earn. per freight-train mile.	262.40	247.00	I. 15.40	6.3
Net " " " "	132.50	111.00	I. 21.50	19.4
Earnings per passenger-mile	3.32	3.44	D. 0.12	3.5
Earnings per ton-mile	1.78	1.90	D. 0.12	6.3

The loss in earnings per passenger-train mile was chiefly due to the large falling off in traffic, the reduction in rates being comparatively small.

LAND DEPARTMENT.

The Land Commissioner reports the total sales for the year (deducting canceled sales) as follows :

	Acres.	Amount.
Minn. & Dakota Division	180,361	$1,080.874
Missouri "	14,070	39,494
Pend d'Oreille "	46,701	179,530
Montana & Pacific "	103,425	382,832
Total	344,557	$1,682,730
Add town lots		14,858
" timber sales, etc		41,832
Total new business		$1,739,420

The average price per acre was $4.88. The number of purchasers was 1,566, the average sale being 220 acres to each.

The preferred stock of the company is received at par in payment for land sold on the Minnesota & Dakota Division. Sales of land on all other divisions are made only for payment in cash or bonds.

The receipts of the Land Department for the year were :

Minn & Dakota Div., preferred stock	$1,196,484
" " " " cash	59.838
All other divisions	416,794
Total	$1,673,116

The total expenses of the department were $424,980. The deferred payments outstanding June 30, 1885, were: Minnesota & Dakota Division (applicable to preferred stock), $1,187,108; all other divisions, $2,043,683; total, $3,230,791.

The report says : "The total acreage of land selected and certified to the company up to June 30, 1885, is as follows :

State or territory.	Granted limits.	Indemnity limits.	Total.
Wisconsin	2,195	6,436	8,632
Minnesota	1,334,096	694,123	2,024,219
Dakota	5,396,100	1,091,675	6,487,776
Montana	612.441	624.175	1,236,619
Washington	97,748	613,114	710,862
Oregon	.....	245,386	245,386
Total	7,442,585	3,274,911	10.717,496

"The lands within the indemnity limits, which are open to selection by the company along the entire line, have, with few exceptions, been selected and certified to the company wherever the surveys have been made by the Government.

"The approximate number of acres of land for which the company is now entitled to patents, by reason of constructed road (including lands already patented), is 43,200,000.

"The number of acres sold from the beginning to June 30, 1885, is 5,468,779, leaving about 37,731,220 patented and patentable still undisposed of.

"Of the above, 3,899,594 acres are east of the Missouri River, the proceeds being applicable to the retirement of preferred stock."

The Government lands along the company's line are also being taken up rapidly, and the number of entries made during the year on Government lands, within the limits of the company's grant, as reported from the local land offices, aggregate 7,571, covering 1,087,823 acres. One-third of these lands was taken up in Dakota, one-third in Washington, and the remaining third chiefly in Minnesota, Montana and Oregon.

GENERAL REMARKS.

The report says : "The principal cause of the decrease in the passenger earnings was the subsidence of the Cœur d'Alene mining excitement which culminated in the spring of 1884. The passenger earnings in the months of March, April and May, 1884, were $1,579,967; for 1885, $732,492—decrease, $847,475.

"The opening of the Union Pacific route to Oregon by the way of the Oregon Short Line and the Baker City Branch of the Oregon Railway & Navigation Company's road in December, 1884, and the snow blockade in Oregon lasting a large part of the winter, and the general depression of business throughout the country, were additional causes of decrease in passenger business. These causes of decrease were offset as to freight business by the steady advance of population and development contiguous to the line of the road. * *

"The amount of general first-mortgage bonds issued during the year—viz., $25,000 per mile on 125 miles of constructed road accepted by the President of the United States, was $3,125,000. Of the $4,143,000 general second-mortgage bonds remaining on hand at the date of the last annual report, $3,000,000 have been sold, making the amount of these bonds outstanding June 30, $18,857,000. The preferred stock is now $38,610,584, being $1,196,484 less than a year ago, this amount having been retired with the proceeds of land sales."

The section of the Wisconsin Division extending from the Brule River to Ashland, the eastern terminus of the road on Lake Superior, 37½ miles, has been completed, and was accepted by the President of the United States on Feb. 6, 1885.

On the Cascade Branch, 87½ miles from Pasco west and 25 miles from Tacoma east have been completed; 40 miles east of the mountains and 25 miles west of them are now under construction. In addition there are 75½ miles to be completed, on which work has not been begun. The estimated cost of completing this branch is $5,911,900, for which there are available $3,512,500 bonds, leaving $2,399,400 to be provided from other sources. The tunnel in the Cascade Mountains will take 2½ years to build.

The bridge across St. Louis Bay, connecting Duluth with Superior and the Ashland Branch, has been completed.

Work is in progress on the extension of the leased St. Paul & Northern Pacific road from Minneapolis to St. Paul. This extension will be used also by the Minneapolis & St. Louis Co., under a contract already made.

Nashville, Chattanooga & St. Louis.

This company operates a main line from Chattanooga, Tenn., through Nashville to Hickman, Ky., 321 miles; the Shelbyville Branch, 8; the Jasper Branch, 25; the Lebanon Branch, 30; the McMinnville Branch, 51; the Fayetteville Branch, 40; the Centreville Branch, 47; the Duck River road (leased), 48; a total of 580 miles. The report is for the year ending June 30.

The only addition during the year was the extension of the McMinnville Branch to Sparta, 5½ miles.

The equipment includes 80 locomotives; 40 passenger, 3 mail and 16 baggage cars; 1,284 box, 56 stock and 559 flat cars; 1 pay, 1 pile-driver and 2 wrecking cars. The company also owns 3-ft. gauge equipment used on the Centreville and Duck River branches as follows: 6 locomotives; 4 passenger and 2 baggage cars; 20 box, 2 stock and 80 flat cars.

The general account is as follows, condensed :

Stock		$6,668,363
Funded debt		8,994,000
Floating debt		616,379
Interest liabilities		444,505
Profit and loss		1,381,068
Total		$18,108 315
Cost of road	$16,950,242	
Stocks and bonds	481,314	
Real estate	62,461	
Cash, supplies, etc	614,298	
		18,108.315

The funded debt includes $125,000 state indorsed bonds : $500,000 bonds held by the United States : $6,175,000 main line first-mortgage ; $1,000,000 main line second-mortgage : $1,198,000 branch line first-mortgage bonds.

The earnings for the year were as follows:

	1884-85.	1883-84.	Inc. or Dec.	P. c.
Freight	$1,435,878	$1,559,766	D. $123,888	7.9
Passage	649,737	663,618	D. 13,881	2.1
Mail	58,597	51,503	I. 7,094	13.7
Rents, etc	96,507	97,199	D. 692	0.7
Total	$2,240.719	$2,372,086	D. $.31.367	5.5
Expenses	1,304,002	1,303,446	I. 556	....
Net earnings	$936,717	$1,068,640	D. $131,923	12.3
Gross earn per mile.	3,863	4,133	D. 270	6.6
Net " "	1,615	1,862	D. 247	13.3
Per cent. of exps	58.1	54.9	I. 3.2	....

In the statements below the main line includes the Shelbyville and the Jasper branches, as well as the main line proper, from Chattanooga to Hickman.

The income account was as follows:

Net earnings, as above		$936,717
Interest and taxes	$682.273	
Improvements	58,402	
		740.675
Surplus for the year		$196,042
Miscellaneous receipts		11.948
Bonds sold		89,512
Total		$297,502
Cost of branch extensions	$65,183	
Bonds redeemed	1,800	
Decrease in floating debt	173,586	
Increase in resources	56,933	
		297.502

The main line earned $205,342 over expenses, interest and taxes; the Lebanon Branch, $27,748; the McMinnville Branch, $9,804; the Fayetteville Branch, $2,086. There was a loss of $26,342 on the Centreville Branch, and of $22,596 on the DuckRiver road.

The traffic reported for the year was :

	Passengers.	Freight.	Total.
Train-miles	611,588	897,824	1,509,412
Car-miles	2,950,215	16,046.717	18,996,932
Earnings per train-mile	107.2 cts.	147.0 cts.	130.8 cts.

The expenses per train-mile were 75.8 cents, leaving the net earnings 55 cents, a decrease of 9.6 cents, or 14.9 per cent., from the previous year. Locomotive service cost 16.54 cents per mile run, the total locomotive mileage being 1,952,329 miles.

During the year 19¼ miles of steel rails and 205,405 new ties were used in renewals. There were 404 ft. of bridging renewed with iron, 78 ft. with wood, and 8,347 ft. of pile and trestle bridging rebuilt. There were 9,986 ft. new sidings built. There are now 288¼ miles of track laid with steel.

The report says : "No dividend was paid during the year, because it was deemed best to apply the net earnings to reduction of the floating debt. If the net earnings, as heretofore, had been divided among the stockholders, 3 per cent. could have been paid on the stock, which, with one exception, is as much as was paid in any year since 1873, when no dividend was declared. The dividends for that period have been :

1874	3½	1878	2	1882	1½
1875	3	1879	2½	1883	2
1876	3	1880	2	1884	2
1877	2½	1881	3	1885	0

"The Nashville & Chattanooga and the Nashville & Northwestern railroads were consolidated in the latter part of 1872; since that date the gross earnings of the main line have been:

1873-74	$1.876 632	1879-80	$1,987.673
1874-75	1,680,826	1880-81	2,103.968
1875-76	1,751.600	1881-82	1,882,781
1876-77	1,632,277	1882-83	2,032,913
1877-78	1.760.100	1883-84	2,115,681
1878-79	1,647,597	1884-85	1,175,114

"It will be seen from this statement that the gross earnings were above the average for the past 12 years, notwithstanding that by the construction of competitive lines we have been deprived of a large share of through traffic, reducing the revenue from through freight over $300,000. The gross revenue has been maintained by the encouragement of local enterprises, and by the purchase and construction of branch roads which act as feeders to the main line. This policy should be continued, and whenever the present floating debt can be extinguished by the sale of the assets now held by this company, which are amply sufficient to do so, and the requisite financial arrangements can be made, the Lebanon Branch should be extended 20 miles to Carthage; the McMinnville Branch, 6 miles, to the Bon Air Coal Fields; the Fayetteville Branch 25 miles, from Elora to Huntsville, and the Jasper Branch up the Sequatchie Valley. No one familiar with the products and resources of the country through which these proposed extensions will pass, can doubt but that they would be paying investments, besides adding largely to the business of the main line."